

Aeronautical Digest

Vol. I, No. 7

OCTOBER, 1922

Twenty-five Cents A Copy

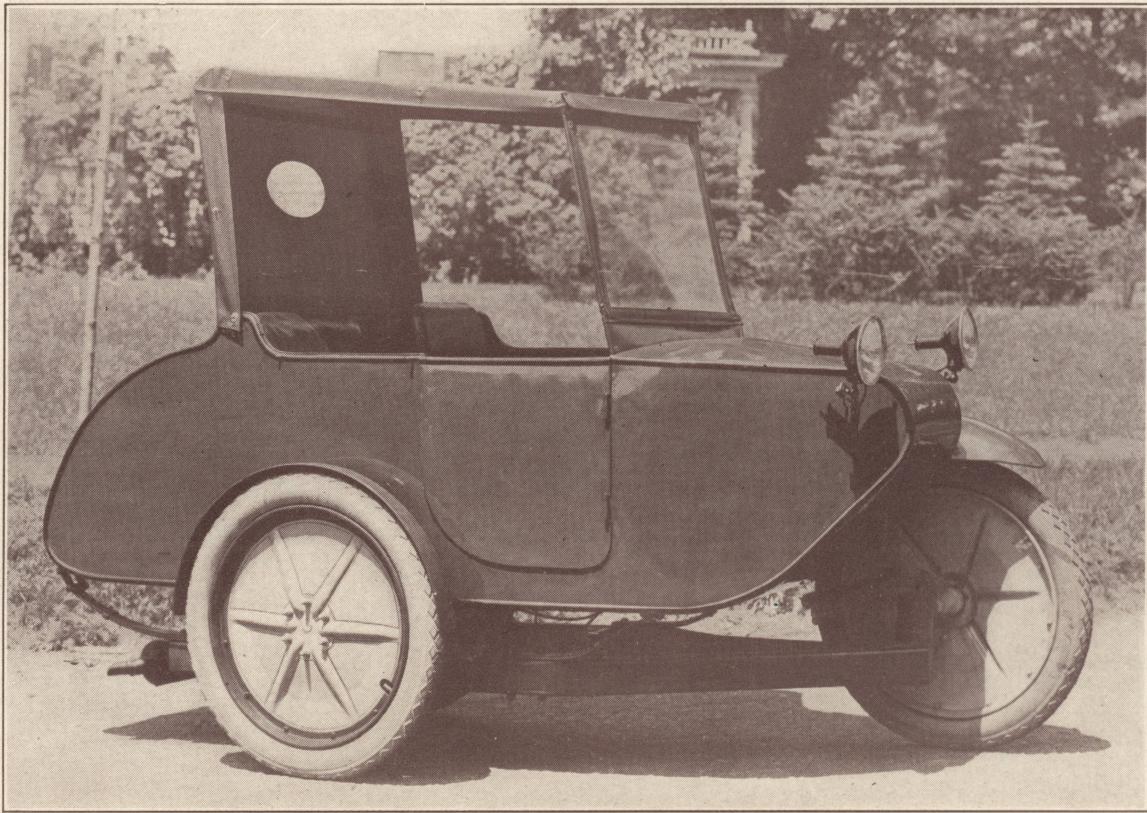


AIRSCAPE OF THE CAPITOL, WASHINGTON, D. C., U. S. A.

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Special Features:

New York-Chicago Air Mail and Merchandise Service—Aerial Photography—Aviation Development in Holland—Motorless Flight—The Air Mail Service in the United States.



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Aeronautical Digest

CHARLES J. GLIDDEN,
Editor

Published Monthly by
AERONAUTICAL DIGEST
PUBLISHING CORP.
Telephone: MURRAY HILL 9750
Cable Address: AEROBOARD

TABLE OF CONTENTS

	Page
Frontispiece	114
New York-Chicago Air Mail and Merchandise Service	115
Aviation Developments in Holland. By William Knight, M.E.	116
Aerial Photography. By Major Hamilton Maxwell	117
Naval Air Station at Lakehurst, N. J., Points the Way to Commercial Enterprise	122
Motorless Flight	124
Conquering Desert Wastes	126
Editorials	127
Airscares: Rotterdam and The Hague ..	128
Entitled to Highest Commendation	129
Aeronautical Hall of Fame	129
King of the Air	130
Progress and Comment	134
Air Mail of the World	139
The Air Mail Service in the United States. By Col. Paul Henderson ..	139
Airplanes	142
Seaplanes	143
Airships	145
The World in General	148

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FOKKER

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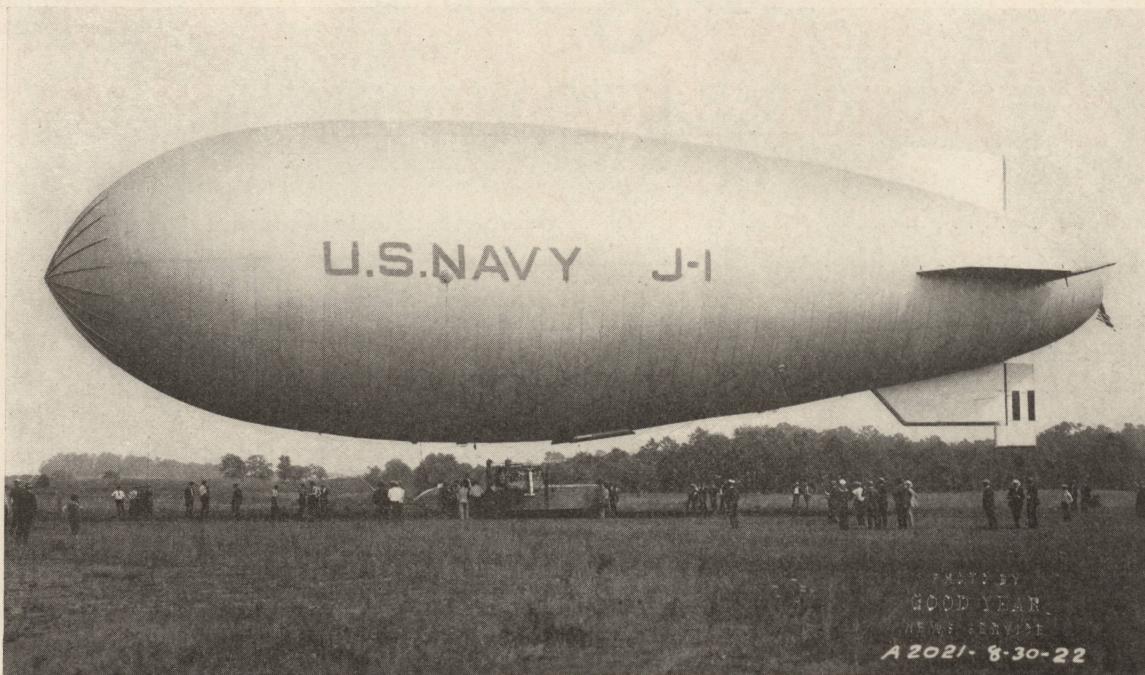
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SIX SEATER MONOPLANES

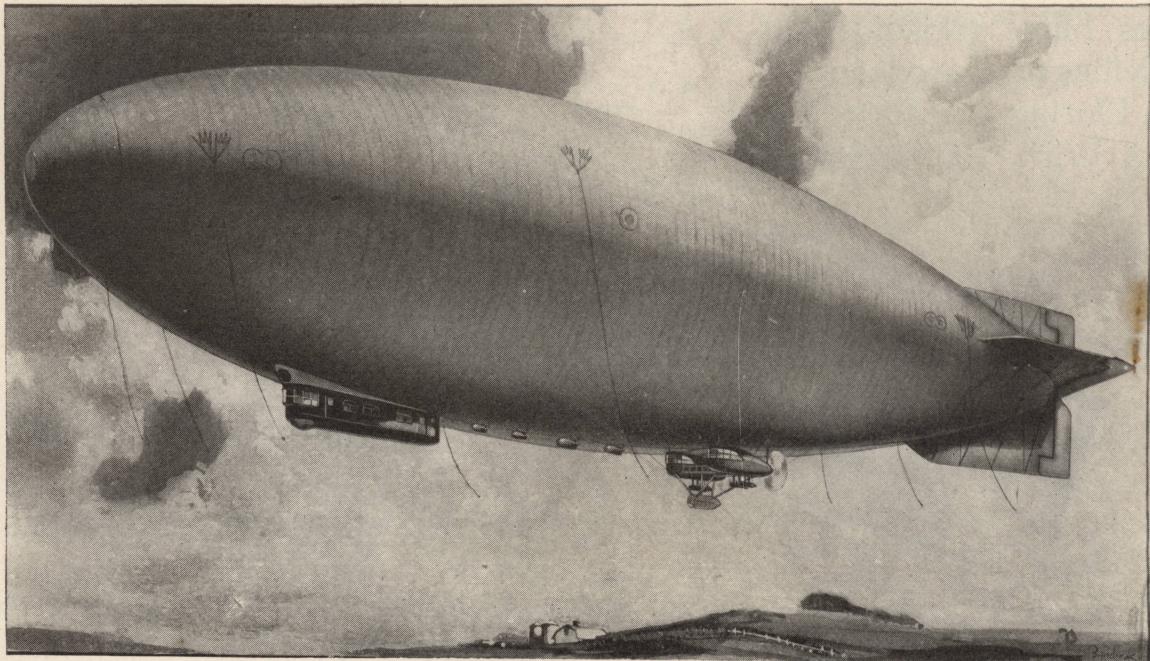
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286 FIFTH AVE., NEW YORK, AND AMSTERDAM



The new navy airship type J, built by the Goodyear Tire & Rubber Co. of Akron, Ohio, recently launched at the company's Wingfoot Lake air station.



The monster semi-rigid airship for the United States Army on which construction will soon be started by the Goodyear Tire Rubber Co., at Akron, Ohio.

New York-Chicago Air Mail and Merchandise Service

THE American Air Transportation Company, now in process of incorporation, is the outcome of an enthusiastic meeting held in New York some months ago, which was attended by representatives of the banking interests of New York, Boston, Chicago and Philadelphia—prominent business and professional men interested in the world's progress, representatives of the Air Service of the United States Army and Navy, the Post Office Department, aeronautical experts and others. A committee consisting of Major Charles J. Glidden, Chairman, Col. John A. Jordan, Col. H. D. Lindsley, E. P. Brinegar, of New York, and J. B. Strauss of Chicago, with Kendall and Herzog, Legal Advisers and W. G. Clark, Consulting Engineer, was appointed, to consider the feasibility of establishing an air mail and merchandise service between New York and Chicago, and instructions have been given to the legal advisers of the Committee, Messrs. Kendall and Herzog, to proceed with the incorporation of the company.

Aircraft manufacturers are in hearty cooperation with the movement, and it is possible to make the necessary test flights over a period of time with airplanes of a carrying capacity of from 1500 to 4000 pounds of useful load, in order to ascertain the class of plane best suitable for the service.

The American Air Transportation Company will be officered by men capable of carrying on to success anything they may undertake, and a New York and Chicago Air Mail and Merchandise Service is assured.

Mr. R. E. M. Cowie, Vice-President of the American Railway Express Co., at a meeting of Aeronautic

Executives held in New York, said:

"The time has arrived for a New York-Chicago Airplane Express Service.

"The possibilities in a regular and dependable Air Express and Mail Service between New York and Chicago are tremendous. Such a service could count upon the active support of the American Railway Express Company with its widespread collection, distributing and advertising resources and profitable mail contracts which would undoubtedly follow a successful demonstration of fast and dependable service.

"Night flights between New York and Chicago with express offers the greatest immediate possibilities if operated with airplanes capable of a pay load, of from one to two tons.

"The best service that can be given by rail is by the night express running on schedule nearly as fast as the Twentieth Century Limited. This service now consumes thirty-six hours (against 7 hours by airplane). That is, a shipment collected some time on a Monday would leave for New York or Chicago on the night express train, arriving at destination Tuesday night, with express deliveries Wednesday morning.

"The Airplane Companies with no pioneer engineering surveys to make, no rights of way to acquire, and no roadbeds to maintain, with an absolute free medium in which to operate and with the advantage of a highly organized industrial area, have only minor initial problems compared to those encountered and overcome with less resources by the early rail interests.

"Airplane traffic is at hand, actually clamoring to be flown as soon as proper

facilities are provided, while the pioneer railroads had to make tremendous capital investments before taking in a cent in traffic.

Mr. W. G. Clark, a prominent Consulting Engineer, says: "The experience of aeroplane transportation companies now operating indicates that planes are being constructed which are capable of maintaining established schedules under reasonably adverse weather conditions between points as distant as Chicago and New York."

ONE PLANE DAILY EACH WAY,
NEW YORK-CHICAGO.

The mileage cost of operation, and apparent profit will then be as follows: The calculated air distance between

New York and Chicago is 712 miles. Therefore, one trip in each direction each day will give a total mileage of	1,424
and for a 300 day year an annual total of (miles)	427,200
The cost of this service will be, per mile	\$1.10
and for the total annual mileage	\$469,920
If each plane carries an average of 1,500 pounds in each trip, the total carries	
each day will be	3,000
pounds, and the total for a 300 day period will be	900,000
pounds, the cost of which will be per pound	\$0.522
If the company is able to secure a rate of \$.80 per pound, then the 900,000 pounds will yield a gross revenue of	\$720,000
Deduct from this the operating cost. \$469,920	

Will leave an annual apparent profit of	\$250,080
The investment should not exceed	\$300,000
(Three Hundred Thousand Dollars)	

To provide for contingencies it is understood the initial capital of the American Air Transportation Company will be \$500,000—with right to increase this amount to meet future extensions of the service.



The Fokker monoplane type FIII Siddley Puma providing accommodation for five passengers and their baggage. Used by the Dutch K. L. M. aerial transport company; built 1921.

Aviation Developments in Holland

By William Knight, M. E.

AM indebted to the courtesy of the management of the Koninklijke Luchtvaart Maatschappij vor Nederland en Koloniën for the following data on the operation of Dutch aerial lines.

The "Koninklijke Luchtvaart Maatschappij vor Nederland en Koloniën" known in England as the Royal Dutch Air Service Company, was established on October 7th, 1919, as the direct result of the full realization on the part of the leading members of a number of large banks, business and shipping firms, that aviation, as a means of transportation must be both rapid and reliable, and must eventually become universal. Only a start was required and the combination of these large banks and business firms gave birth to the present K. L. M.

This company started its activities by operating the Dutch-English route only. That it proved successful was clearly shown by the fact that on June 28th this service, which had previously been run only every two days was extended to a daily service and on July 12th to a twice daily service.

During the year 1920, 54 machines travelled between England and Holland, 345 passengers, 22 tons of merchandise and 3 tons of mail were transported.

During the last two months of 1920 the service was extended to Hambourg and Copenhagen.

On April 14th, 1921, the K. L. M. reopened its summer service with its own fleet, consisting of ten Fokker monoplanes, equipped with S. P. 230 H. P. motors and providing accommodation for five passengers or a useful load of 1,000 lbs.

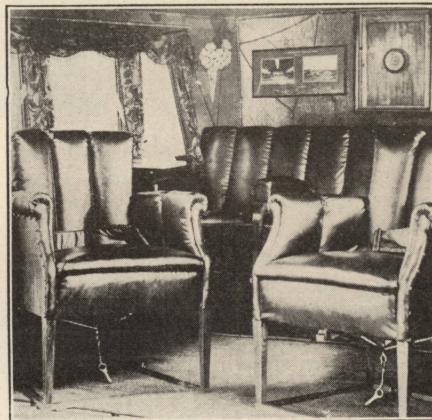
The regular lines on which a daily service was operated, were: Amsterdam-Rotterdam-London and Rotterdam-Amsterdam - Bremen - Hambourg. At Bremen a connection with the line Bremen-Berlin was established.

In cooperation with the Belgian Sneta Company (Société Nationale Pour L'Etude des Transports Aériens) and the French companies C. M. A. (Compagnie des Messageries Aériennes) and Farman, a line Amsterdam-Rotterdam-Brussels-Paris was opened in May, 1921, the C. M. A. and the Sneta running a daily service, and Farman an alternative non-stop service between Amsterdam and Paris.

The service of the K. L. M. was provided for daily with seven machines all together flying some two thousand miles per day.

From April 14th to October 3rd, when the summer service was closed and the German line was discontinued, on the Amsterdam-London, Rotterdam-Hambourg and Amsterdam-Paris lines, 290, 278 and 433 flights respectively were made, a total of 1,000 flights and 4233 flying hours, during which a distance of some 300,000 miles was covered without a single accident and without injury to passengers or personnel.

On these 1,000 flights the K. L. M. transported 1,511 passengers, 31 tons of merchandise and 1.39 tons of mail.



Interior of passenger cabin of 1921 model Fokker monoplane type FIII, used by the Dutch K. L. M. aerial transport company.

The line to Brussels and Paris continued being in operation and from October 3rd to December 31st, 1921, 92 flights were completed on this line, during which 153 passengers, 8 tons of merchandise and 350 lbs. of mail were transported.

The figures representing the traffic over the K. L. M. lines during the year 1921 are: 1664 passengers, 38.6 tons of merchandise and 1.5 tons of mail.

Available figures on the operation of K. L. M. lines up to August 1st, 1922, are as follows:

From January 1st to August 1st on the line Amsterdam-Paris 332 flights were made, 272 passengers, 10.6 tons of merchandise and 300 lbs. of mail were transported.

On the line Amsterdam-London from April 18th until August 1st 230 passengers, 30.2 tons of merchandise and 1.1 tons of mail were transported.

Thus on 593 flights, covering a total of about 112,700 miles, 502 passengers, 40.8 tons of merchandise and 1.2 tons of mail were transported from January 1st to August 1st, 1922.

An outstanding feature of the operation of K. L. M. lines so far has been the remarkable regularity of the service which has been continued according to schedule in any weather.

Also it is gratifying to notice that Dutch merchants have not been slow in realizing the importance of aerial lines in helping the development of their export business. One firm manufacturing hats in Holland is using K. L. M. lines for exporting to England its entire output.

On June 1st the Sneta discontinued its service between Brussels and Paris and this service was taken up by the K. L. M. which is now operating alone the line Amsterdam-Rotterdam-Brussels-Paris.

It is the intention of the K. L. M. to continue during the winter both the lines leading to Paris and to London, with the only difference that beginning September 1st, the Amsterdam-London service will be changed from a twice-daily service to a single daily service.

Insurance companies in Holland are visualizing the importance of civil aviation as a new means of transportation and, judging from the present stage of development of aircraft, have decided that it is good business to insure flying personnel, aircraft and merchandise. An agreement has been reached by several insurance companies to this effect.

An interesting experiment is being made by a large firm of flower-growers in Holland. They have picked two separate lots of flowers simultaneously, and have packed one lot in a sealed box, despatching them by air to Croydon, with instructions that they are to remain unopened and to be returned to Holland by air the next day. The other lot has also been packed in an identical box and sealed, but has remained at the offices of the company in Holland. The idea is to see what effect the air journey in the cabin of one of the Fokkers, with the traces of hot exhaust gases, which inevitably find their way into the best aeroplane saloons, has on the flowers. If it is found that there is little or no deterioration, says "Flight," large consignments will be dispatched by air.



DOWNTOWN N.Y.C.

© MAJOR HAMILTON MAXWELL

New York City downtown district. This beautiful photograph was taken by Major Hamilton Maxwell, of 141 West 33rd St., New York City.

Aerial Photography

By Major Hamilton Maxwell

AS it is almost impossible to write a comprehensive article dealing in any way with aerial photography without first touching on the seeds from which this interesting new work has sprung it will—even at the risk of boring any possible readers—be necessary for me to go back as far as 1914 and the late war. For it was the demand of the various allied staffs for better and more accurate information than could be obtained by the Army Intelligence Departments through their usual channels which really gave this work the impetus that has now brought it to a remunerative branch of aviation.

Hence the first camera actually built for use in the air was evolved, which in the case of the British R. F. C., was a wooden hand held affair which was operated by observers, the majority of whom knew nothing whatever of photography,

and whose resultant pictures of the high angle oblique or birdseye variety clearly showed this lack of photographic ability and acumen. It was not until the 21st of June, 1915, that a camera was first fastened to the fuselage of an aeroplane so as to obtain reasonably correct vertical or mapping photographs. The writer can well remember the thrill that went through all of those present when these first negatives were held to the light and found to be clear and sharp and in every way superior from the mapping point of view to those obtained by the hand held camera.

This early and exceedingly crude manner of mounting an aerial camera opened up a new field in map making, and one may reasonably say that it was from that date that aerial photography really came into its own, to gradually grow in importance and usefulness, until at the beginning of the Somme operations

in 1916, practically no orders for even minor activities were ever issued until vertical aerial photographs of the terrain in question had been freshly taken and very carefully studied. While at the end of 1917, and the beginning of 1918, aerial photography formed such a huge part of the daily program of the Allied air forces that over 200,000 prints enlarged from some 12,000 to 15,000 freshly taken negatives used to be distributed to the various units on the British front alone daily, the majority of which went to build up huge mosaics or aerial maps, from which all the army operations of any importance whatsoever were planned and carried out.

I do not suppose that less than 90% of all the thousands of men employed in this work during the war failed to see the vast possibilities that lay in the successful adaptation of this work to commercial enterprises; and from the time of

the armistice onward small mushroom companies sprang up all over this country, Great Britain, Canada, and France, most of them run and financed by men of small means and less ability, and which disappeared almost as quickly as they had sprung up, leaving in circulation in the great majority of cases numbers of poorly taken photographs and what was much more unfortunate, a considerable number of people, who with their failure to obtain the pictures so glibly promised, pigeonholed their vague and temporary interest in this work in some cases for all time.

Curiously enough the class of aerial photograph, i.e., vertical, that was well-nigh universal under war conditions took a back seat in times of peace, though everybody connected with this work knew that these were the most useful, and certainly the most potential from the point of view of revenue, but it was well-nigh impossible to get the general public or big business concerns

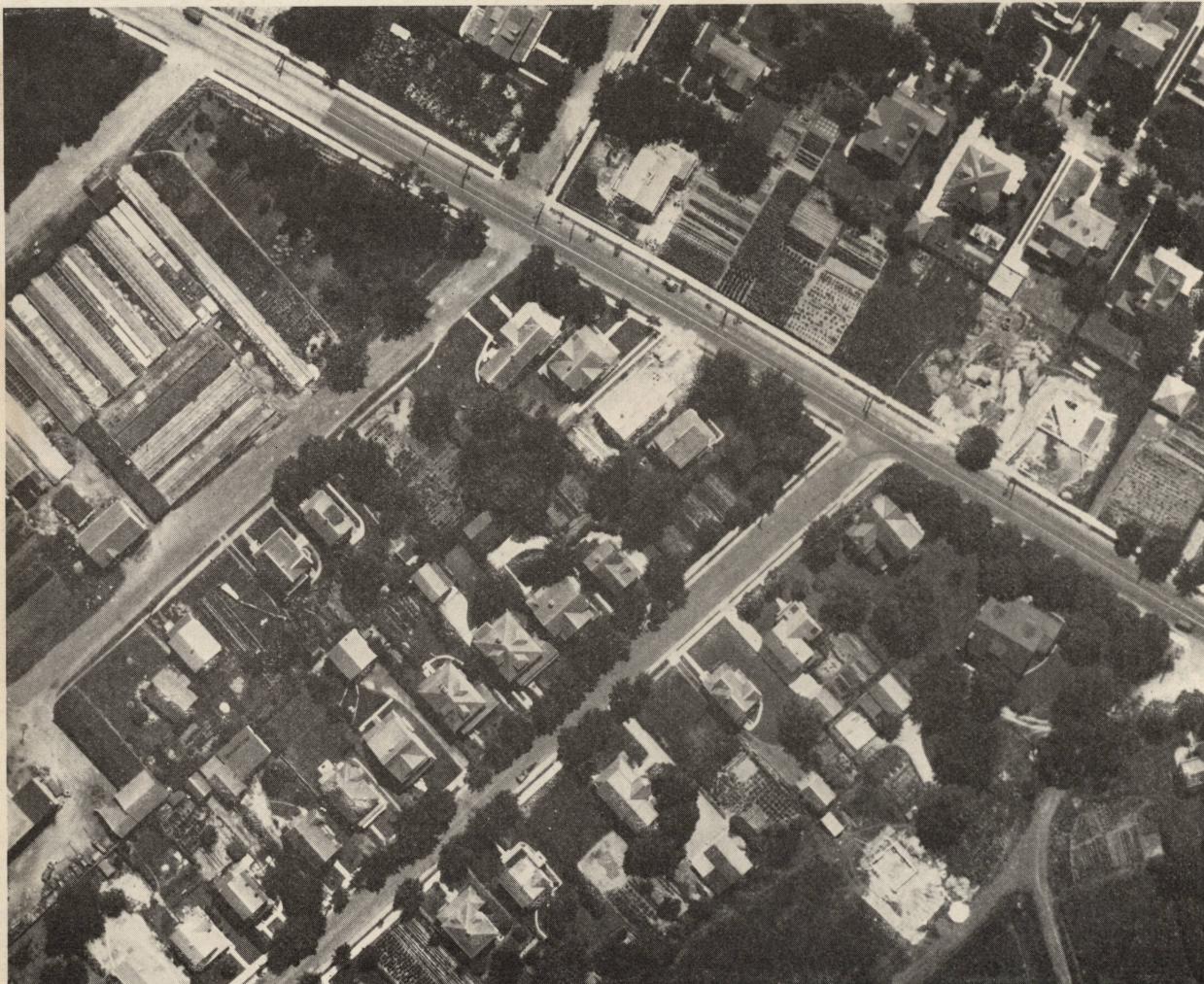
to see this, and the oblique or birds-eye picture at last came into its own. Most of the world's newspapers commenced publishing practically every week aerial photographs of this and that and the other thing, most of which one had to either lie down or stand on one's head to understand or even partly visualize.

Practically every class of business gradually became interested to some extent in this type of picture, and as better cameras were evolved and men of real photographic ability trained, the oblique photographs have now commenced to take on such shape that the pictures of landscape and wash drawing artists are gradually being used less and less, until these people are usually only called in to make drawings of plants whose owners desire their own imaginations rather than what is actually there to govern the shape and size of their buildings and surroundings.

The possibilities and use of the oblique type of pictures so obviously

speak for themselves that it is only necessary to look at a few really well taken samples to be just as "sold" on this idea as the most enthusiastic of salesmen. Suffice it to say that such people as the Tidewater Oil Co. (Bayonne Refinery), Metropolitan Life Insurance Co. (Sanitorium at Mt. McGregor, N. Y.), Hecker-Jones-Jewell Milling Co. (Mill on E. River.), N. Y. Central Railroad (lines around N. Y. City), N. Y. Botanical Gardens (views of gardens), Corn Exchange Bank (views of their buildings), National City Bank (views of N. Y. for their foreign branches), Sanborn Map Co. (photos to go with and illustrate their Msc. maps), Connecticut Highway Commission (map of Connecticut highways), and many, many others are using or have used this class of photograph (and in many cases the vertical and mapping pictures as well) in connection with their various classes of business.

Slowly but surely the mapping



(Hamilton Maxwell, Photographer, New York City)

Type of aerial photography giving positive information—Scale 1 inch equals 92½ feet.



(Hamilton Maxwell, Photographer, New York City)

Type of vertical aerial photograph giving negative information, taken with a 12 inch lens from 800 feet altitude.

pictures have been coming into more and more prominence until now they threaten to put their younger brother, the oblique picture, in the shade.

From the rough and ready mosaics made of the various battle fronts these maps steadily improved in quality and accuracy until it became possible to cover quite a large area of country to a scale of some thousand odd feet to the inch, with an appreciable error of not more than 10% in poorly put together maps, or more than 5% in incorrectly or poorly assembled mosaics.

Due to the fact that the higher one flies the stiffer the air conditions, it has usually been customary to make mosaics from an altitude of some 10,000 feet and as the type of lens considered most suitable for this type of work was of a focal length of 12" on a film of 18x24 centimeters, the majority of these mosaics so far have been more useful from a point of view of negative rather than positive information.

By this I mean it is easier to see what is not there than it is to see what actually is there, and this in the opinion of the writer limits the uses of such mosaics to mere wall maps.

In my humble opinion what is required is detail and still more detail, and I venture the opinion that very soon mosaics, at any rate in the very great majority of cases will never be accepted or even contracted for under a scale of 400 ft. to one inch, while in the great majority of cases an even bigger scale, say 100 feet to one inch will be required, and if this work is to get anywhere (by which I mean be taken up and used by the big engineering firms), such mosaics will have to be made and delivered in this way.

As one of the great uses of the aerial mosaics at present appears to be a preliminary step towards the choosing of the best line on which to start a survey party, this lack of visible contours would apparently not be any great drawback. For one thing the amazing amount of detail which is so readily apparent in a

properly taken vertical photograph, coupled with the fact that in the great majority of cases these photographs show a great number of existing maps to be either so out of date and even inaccurate that the user almost at once forgets the lack of contours so interested does he become in the comparison of the two results.

One of the greatest difficulties facing the aerial map maker lies in the apparent inability of present day pilots to keep their machines at any desired altitude. In many cases this is by no means the fault of the pilot but due to lack of proper instruments which will register the correct altitude one is flying at irrespective of changes in weather conditions.

At the present time one has to depend almost entirely on the barometer type of altimeter, which with a sensitive one will vary as much as 400 feet over an hour's flight and if one uses one not so sensitive it is difficult to tell within 200 feet of just what height one really is flying at.



(Hamilton Maxwell, Photographer, New York City)

Panorama of New York City.

When one is using a 12-inch lens at an altitude of 12,000 feet, a variation of 200 feet makes little or no difference but with a 20-inch lens from this altitude this amount of variation makes quite a difference, which in the case of a lineal map from 5,000 feet (which very often has to be done) almost certainly spells disaster.

The writer has now been actively engaged in aerial photographic work for over eight years, and although the business of making surveys and maps from the air is admittedly only in its infancy, I confidently assert that before very long aerial photography will become at least 40 per cent if not more of aviation as carried out in this country; for although many engineering firms are still skeptical of the possible benefits of this work as applied to their business needs, some of these are being converted every month and in the not far distant future I fully expect

to see aerial photography become the generally recognized means of making at least 50 per cent of all the various surveys and maps in this and most other countries.

Major Hamilton Maxwell, whose article on aerial photography appears in this issue of Aeronautical Digest, was born in Sydney, Australia, where he lived the first part of his life. The war found him in England, and as he had to return to Australia to get into the Australian forces; he joined a Yeomanry regiment at the end of 1914 and finding that there was very little chance to get anywhere with the cavalry, he later joined the Royal Flying Corps. He was the first civilian to be given a commission as a photographic officer in this corps and was sent to France the early part of May, 1915.

Practically all of 1916 he spent in the trenches with the second and third British Army, returning at the beginning of 1917 to England on promotion to cap-

tain, where he stayed except for short visits to the front in connection with his work. For the last 17 months of the war he was in charge of all photographic training at the Air Ministry, London, having under him some 400 officers and from 2,000 to 3,000 men, and over-seeing the training over the whole of the British Isles, Canada and Egypt, so far as aerial photographic work was concerned.

He was discharged in March, 1919, and came over here in September, 1919. Since that day he has spent ten months in Canada, flying continuously and experimenting with aerial mapping, cameras, etc., during which period he carried out two big tests for the Eastman Kodak Company on their new aerial cameras, including their K 1 and another which has not yet been put on the market.

Since then he returned to this country where he started in business for himself some 18 months ago, and is now in the position of having a business which is rapidly growing into something really worth while.



Major Hamilton Maxwell, of the British army, who during the war was in charge of all photographic training at the Air Ministry, London.



Mapping camera extensively used by the U. S. Navy for taking pictures of the coast line and harbors.



Camera gun mounted on a U. S. Navy aircraft equipped with photographic paraphernalia.

Naval Air Station at Lakehurst, N. J. Points the Way to Commercial Enterprise

By Lieutenant T. T. Patterson, U. S. N.

SHALL we look to the air for the solution of the vexatious problems of transportation which today baffle the best minds of the industrial, financial and political world? Is the answer to be found in huge ships swiftly cleaving the sky and rivaling the leviathans of the merchant fleets which traverse the seas?

The Naval Air Station at Lakehurst, New Jersey, has been developed as a construction and operation station for the rigid airships that are now under construction for the Navy. Conceived under Naval supervision and brought into existence to serve the Naval establishment, it bids fair to serve an end equally important to that of national defense. For every problem that has been worked out at Lakehurst by the Navy is a lesson in development to industry and commerce which will follow inevitably in its footsteps. Aerial transport had arrived at a stage of usefulness in Germany before the war which was a matter of great pride and hope to those who fostered it. The millions in money spent and the difficulties and problems entailed in the working out of the practical airship were borne by Count Zeppelin who drew upon immense financial resources and an indomitable will to succeed.

And, lacking the personality of a man with the resources of great wealth and enthusiasm, a project such as aerial transportation should be fostered by government agencies.

The air station, as planned and built, at Lakehurst, included a shed of tremendous size for the housing of ships, shops for repair work, a gas plant and tanks for storing the gas used for the inflation of the rigids, quarters for personnel, and a mooring mast where the airships could be secured when not in the shed and an anchorage for the ships on the field.

The outstanding features of the Naval air station are the shed for the housing of rigid airships and the mooring mast that has been constructed as a means for securing ships temporarily when not in the shed.

The shed itself is an enormous structure 800 feet long with an entrance 172 feet high and 253 feet wide. The total height of the building is over two hundred feet. But dimensions cannot adequately convey the impression of its size. It covers the largest space under one roof in the world.

The R-38 was the largest rigid airship ever built. It had a cubic capacity of 2,700,000 cubic feet and was 86 feet in diameter. The shed at the Lakehurst station could house two ships each with a diameter of one hundred feet, and with a cubical capacity of five million feet or one ship of ten million cubic feet.

The ZR-1, otherwise known as Fleet Airship Number One, is now in the course of construction at the Lakehurst station and will, according to present indications, be completed in June of 1923. The parts of the giant ship are being made at the Naval Aircraft Factory in Philadelphia and are shipped from there to Lakehurst.

The housing of the fleet airships will resemble very much the bringing of a ship into dry dock and this is only one point of analogy between the ship of the air and the ship of the sea. With securing lines running from her bows and quarters and secured to the docking rails, the ship will be slowly conned into the shed. As the surface ship takes into account tidal and other currents which may affect her movements when being handled around a dock, or in a narrow and confined space, so must the airship have due regard to wind currents, particularly when being placed into or taken out of the shed. Her nose must be kept to the wind

until it is inside of the hangar, and, if a cross wind is running, to the direction in which she must be headed for the door of the shed, a high standard of "airmanship" is required to safely bring her into "dock."

The mooring mast which has been erected at Lakehurst is the first to be built in this country and is the only one of its particular type in the world. It rises to 165 feet above the ground and affords a safe anchorage for the ships which are to operate from the station. The mooring mast for airships has solved many of the greatest difficulties which have stood in the way of operating ships of this size. The matter of placing a ship in a hangar is a difficult, cumbersome operation, involving time and a great amount of labor. With airships of the size which can be usefully operated for commercial purposes, and such as are now being built for the Navy, it is just as reasonable to place the ship in the hangar when not in actual flight as to place a battleship in drydock whenever she has occasion to drop anchor. With the mooring mast the necessity for housing the ship is obviated.

The mooring mast for airships has been recognized in years past as an invaluable piece of equipment for the handling of airships, and as such has had some development abroad. Tests of the practicability of the masts have demonstrated their utility under most severe conditions. Airships secured at a mooring mast have weathered a blow of forty-five miles per hour and more, and it is confidently believed by experts that an airship moored to a mast could ride out even higher winds.

The facilities provided for the handling, stowage and securing of airships at the station are three fold in character. First, the huge shed which provides ample stowage space for several ships of moderate size and can accommodate two ships as large as the largest ever built in the world. Here

the great rigid will find a safe harbor under extreme conditions of weather; here they will be taken for repairs and overhaul; and, as is now the case, here will take place the assembly of new construction in the future. The mooring mast will be in effect the way station of the ship where temporary landings are effected for discharge and taking on of personnel, replenishing of fuel, water, gas, and ballast, and securing of the ship in moderately heavy weather. And the mooring points on the field will find use as berthing space in fair weather.

The station is further equipped with a radio plant for communication with the ships it is designed to serve and with a power plant for the generator of electrical power. A complete aeronautical station is also included where accurate information is recorded on weather conditions in the upper air strata, and such information is exchanged with other air stations as a service to aircraft. On the top of the huge hangar the New Jersey Forest Patrol have been assigned a berth from which the surrounding country for twenty-five miles around may be observed.

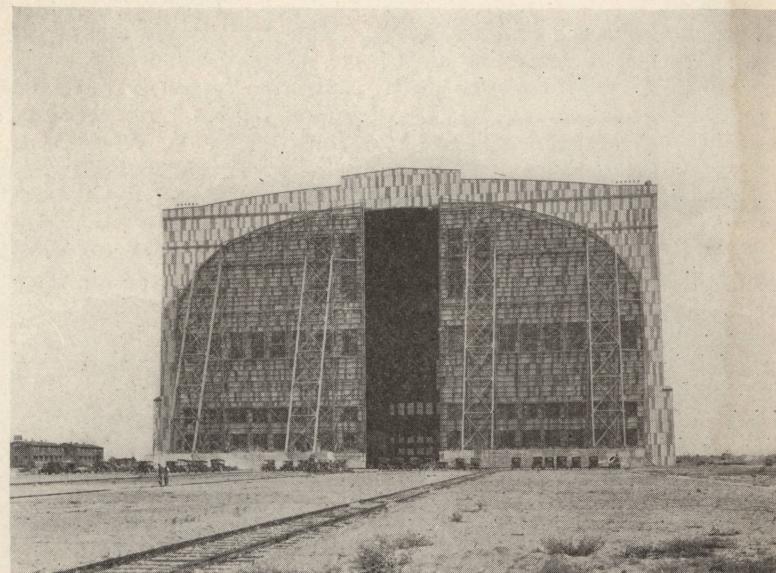
Three gas tanks, having a total capacity of one million thirty-five thousand cubic feet of gas, are provided in connection with the gas plant installed at the station for inflation of ships. These tanks are also suitable for the stowage and accumulation of helium gas.

The complete station gives an accurate conception of the equipment that must be provided in a terminus for airship lines operating on trans-continental routes of the future. There would be need for two or perhaps three similar stations to serve a fleet of ships operating under a commercial company. One would exist on the Atlantic Coast, one on the Pacific Coast, and a third in the Southern part of the country. In addition to these, way stations would be provided along the projected route. The way stations could be limited in size by the use of mooring masts so that a plot of ground 2000 feet square would easily provide the necessary space for all facilities. On a trans-continental passage, stops would be made at the mooring masts for passengers and freight, and for fuel, gas, and other supplies. The large carrying capacities of the ships would afford a valuable means for supplementing express and mail carrying facilities, and perishable freight could be transported in considerable quantities.

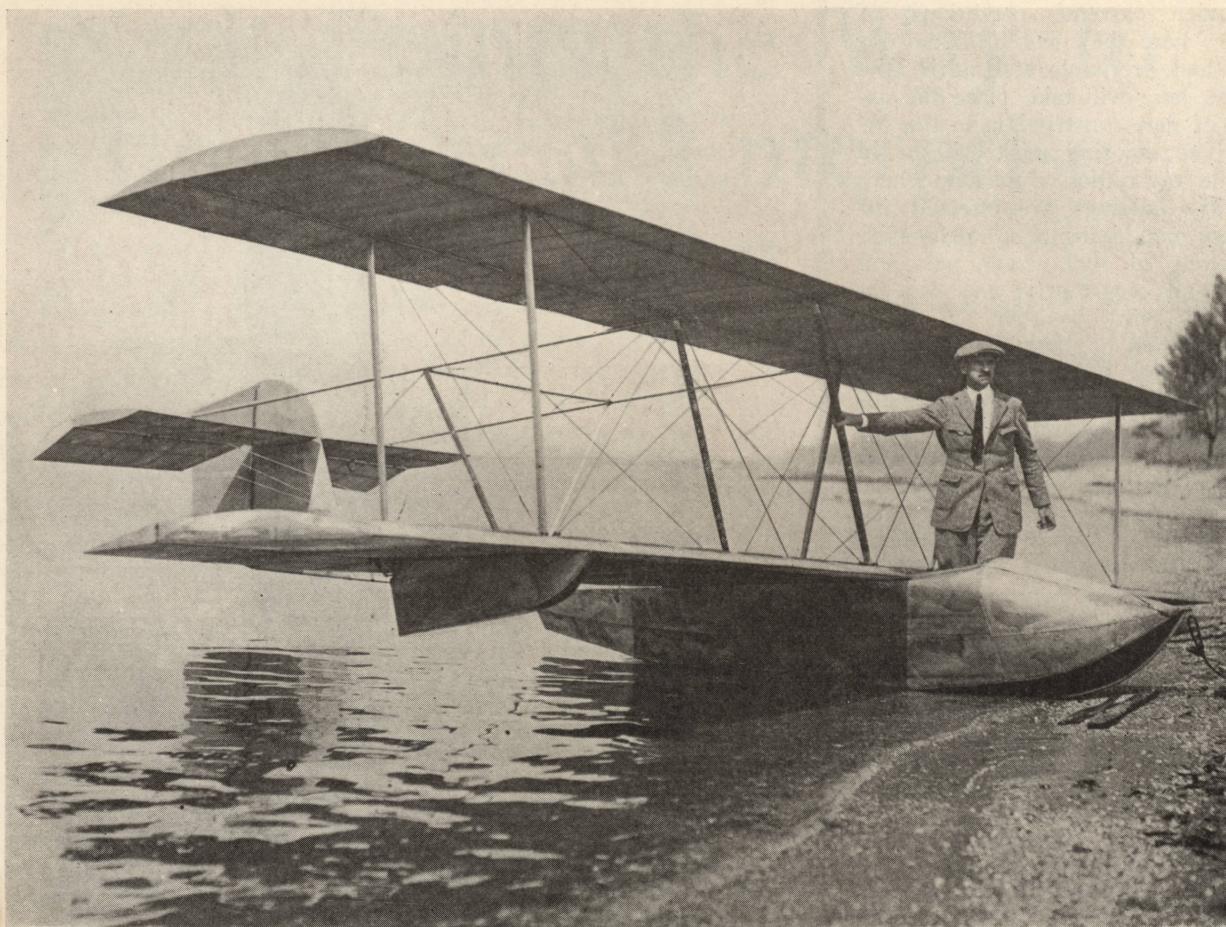
And so the work of the Navy at Lakehurst is being watched attentively by those who are intimately concerned with these problems for this is pioneer work looking to a future of infinite possibilities.



4,000 pound bombs used by the U. S. Air Service. Bombs similar to this but much less powerful were used to sink the battleships off the Virginia Capes last year.



Giant airship shed at the naval air station, Lakehurst, N. J., where the rigid airship ZR-1 is now in course of construction.



Glenn Curtiss tests new glider motorless seaplane in Hempstead Bay.

Motorless Flight

By Glenn H. Curtiss, of the Curtiss Aeroplane & Motor Corp;

THE astounding success of the German, Heutzen, in remaining aloft in a motorless airplane for two hours and ten seconds opens the door to a new phase of aeronautical development.

At the beginning of the twentieth century many inventors in various parts of the world were building and trying out gliders. It was the needful preface to motor-driven flight. In 1907 we constructed and flew several gliders of flimsy fabric and wood construction. Shoving off from the 300-foot hills in the vicinity of Hammondsport, N. Y., we glided safely and successfully for some seconds. Our gliders were equipped with one elevator simply and had but little inherent stability. We were then chiefly interested—as were most of our contemporaries—in solving the problem of control. At that early date this was accomplished often by shifting the body.

The development and application of the internal combustion engine to air navigation turned the attention of engineers to speed, and this interest was intensified by the World War, with a consequent improvement in mobility of all types. Speed, since the ending of the war, has lost none of its attraction for us, as well as for the other Allied nations, and in the United States, England, France and Italy splendid advances have been made in overcoming resistance and inertia.

Experimentation along this line has been going on since 1919, though the flights last year in the Rhone Valley were the first public demonstrations. The Germans, unhampered as we were twenty years ago by imperfect control and possessing practical knowledge which no one had at that time, began immediately with a great advantage. But even so, their success is a challenge to the rest of the world.

Out of gliding and soaring flight we can learn how to build lighter, more efficient airplanes, and, having built them, to utilize natural air currents to the consequent saving of artificial motive power. The wind tunnel, in which scale models of airplanes are tested, performs admirable service, but nothing can equal practical, full-sized trials.

We are now at a stage in aeronautics in which the buzzard and the albatross appear prominently. The buzzard is a magnificent soarer. In flat country, where the buzzard is most frequently found, air rises from the surface of the earth in waves and sometimes in spirals. Frequently I have watched a buzzard, with marvelous instinct, seek and find "lodgement" in one of these spirals and thus be literally lifted out of sight.

Over the water the albatross is king of the air. He is superior even to the buzzard. The buzzard is comparatively lightly loaded, sometimes only one-half pound to each square foot of wing surface. The albatross has a wing loading of more than three pounds a square foot.

The German and French experiments have been confined to hilly areas. I believe that the greater field lies over the water. The albatross with little effort takes off from the crest of a wave and rides the winds for hours. If we can learn the secret of the albatross's instinct we too can soar at will over the surface of the sea.

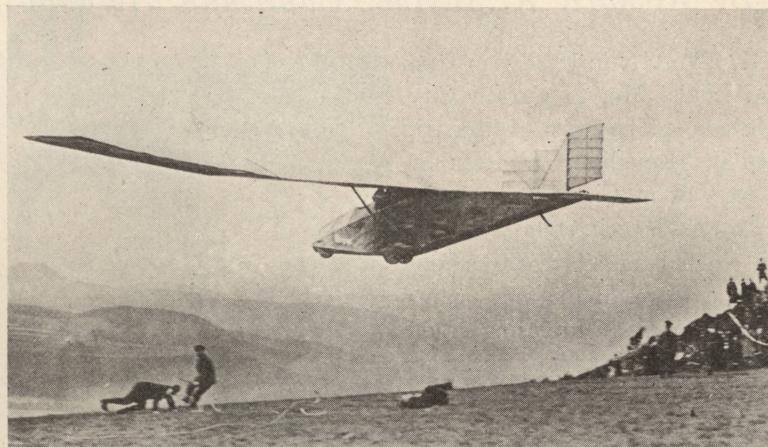
The Germans have very appropriately called their gliders "sail planes." Gliding or soaring is simply aerial sail-boating in three dimensions. In marine navigation we have developed many types of craft and methods of operation. In the air we have a broader opportunity. By lessening our speed and increasing our load we cheapen air transportation and make it more generally available. Air sailing in three dimensions is certain to be a great sport—especially over the water. It may be that "pedal planes" will supplement sailing for sport, but for practical commercial air transport we shall apply low powered engines to the results of our gliding and soaring.

The Curtiss Aeroplane and Motor Corporation has made gratifying progress in speed, being the holders of the world record of 176.7 miles an hour as made in competition. It is constantly experimenting, however, along other lines and has just completed a biplane flying boat glider which it proposes to try out on Great South Bay within a fortnight.

Our desire is ultimately to emulate the albatross—so to maneuver the motorless glider that it will take off from the surface of the sea. I believe it can be done. At first we shall try launching from the deck of a speed boat or by towing. Our glider is constructed of wood, duralumin and silk. Its dimensions are: Weight (empty), 150 pounds; loaded (one man), 310 pounds; span, 28 feet; chord, 60 inches; gap, 54 inches. Length over all, 22 feet 11 inches; wing area, 267.5 square feet; hull, 13 feet 2 $\frac{1}{4}$ inches long, 30-inch beam. The hull is made of duralumin. The glider is designed to fly at twenty miles an hour.

General Patrick and Admiral Moffett, of the army and navy air services respectively, are watching these experiments with a view to military application.

My earnest hope is that America can shortly hold an international gliding and soaring competition.



German glider "Vampyre," winner of the world record for motorless flight.

Mr. Glenn H. Curtiss was asked if he believed speed and momentum were necessary in order to keep a glider in flight.

"We do not know how the albatross keeps in motion," he replied. "But we are of the opinion it takes advantage, by lowering its wings, of puffs of wind to give it renewed motion. We know it can soar for a considerable distance."

The success of the German aviator Hentzen and further experiments with the Curtiss glider have attracted unexpected and unparalleled interest in England and newspapers are urging the British Government to bestir itself and investigate along the lines of glider development.

Admiral Mark Kerr, praising Hentzen's feat, adds: "These experiments undoubtedly have many excellent results. A greater degree of control is obtained, and by continually experimenting with wings, streamline body and new fabrics, more speed will be attainable."

Prof. E. P. Warner, representing this country at the French and German soaring competitions, returned to this country last month after the competitions were over.

In an interview at the offices of the Aeronautical Chamber of Commerce, 501 Fifth Avenue, Mr. Warner declared that probably 40 per cent. of the patronage of the score or more of European aerial transport lines is American, indicating no lack of interest on the part of the American public. "The outstanding fact seems to me to be the necessity for the United States to enact without further delay, the Wadsworth-Winslow bill, creating a Bureau of Commercial Aeronautics in the Department of Commerce, and providing for regulation and inspection and for the development of airways and terminals. It is a world-race in the air. We should be warned by what other nations have done."



The German Secretary of State Lewald congratulating Martens (left) and Hentzen (right) for their record in motorless flight.

Conquering Desert Wastes

By Richard R. Blythe, Chairman Aeronautic Executives Organization

MARK TWAIN in 1862 went from St. Louis, Mo. to Carson City, Nevada. The part of the trip described in "Roughing It" from St. Joseph to Carson City by coach for the fare of \$150. each, states:

"Our coach was a great swinging and swaying stage, of the most sumptuous description—an imposing cradle on wheels. It was drawn by six handsome horses, and by the side of the driver sat the conductor, the legitimate captain of the craft; for it was his business to take charge and care of the mails, baggage, express matter, and passengers. We changed horses every 10 miles, all day long, and fairly flew over the hard, level road."

About one hundred miles west of Salt Lake City the travelers entered upon an alkali desert. For sixty-eight miles there was one break in it. There was a stage station there. It was forty-five miles from the beginning of the desert and twenty-three from the end of it.

Follows a description of the means of travel across the desert, the best transportation that money could buy in 1862.

The mules, under violent swearing, coaxing, and whip-cracking, would make at stated intervals a "spurt", and drag the coach a hundred or maybe two hundred yards, stirring up a billowy cloud of dust that rolled back, enveloping the vehicle to the wheeltops or higher, and making it seem afloat in a fog. Then a rest followed, with the usual sneezing and bit-champing. Then another "spurt" of a hundred yards and another rest at the end of it. All day long we kept this up, without water for the mules and without ever changing the team. The alkali dust cut through our lips, it persecuted our eyes, it ate through the delicate membranes and made our noses bleed and kept them bleeding—and truly and seriously the romance all faded away and disappeared, and left the desert trip nothing but a harsh reality—a thirsty, sweltering, longing, hateful reality!

As the latest reports come in on the railroad strike, a graphic tale is told of the furnace like blasts that sweep over the steel railroad coaches as hour after hour they crawl along under the



R. R. Blythe, chairman and organizer of the "Aeronautic Executives of the United States," whose writings are doing much for commercial aviation.

relentless rays of the sun beating on the sand.

It has been reported that three trains carrying about four hundred passengers were stopped at Needles, Arizona, when their crews in compliance with a decision of the railroad brotherhoods refused to move them.

Needles, famed as one of the hottest spots of the desert, showed a temperature of 108°. The indication of August eleventh showed no relenting on the part of the sun.

Meager information described the passengers as sweltering beneath the burning desert heat. No cloud in the sky, no shade trees on the right of way broke the fierceness of the sun. No breeze was stirring.

The Pullman cars offered the only refuge, and they, according to the railroad's custom in crossing the desert, had every window and door closed as protection against hot blasts from the waste lands and flying dust.

The foregoing stands as a graphic example of the present accepted mode of transportation—long weary hours under the blistering sun as the train crawls over the parched and sand covered wastes.

Yet, there is an avenue of commodious travel awaiting any and all who desire to glide through the cool blue air lanes of the sky, far above the

hot beating rays of that molten orb which has taken its toll of human sacrifice.

Over this same territory the intrepid pilots of the United States Air Mail Western Division have flown, day after day for a period of over two years.

At the present time mail planes are flying each week day in both directions from New York to San Francisco. These carry way mail, not through coast-to-coast mail. For instance, at New York the heavy letter train mail leaves for Cleveland at 8:30 P.M. and arrives in time for morning distribution. Mail received in New York after 8:30 cannot reach Cleveland by rail in time for distribution the next day. So this overflow mail is sent by train to Mineola, N. Y. at about 4:30 A. M. and is flown to Cleveland by plane leaving Mineola at 7 A.M., arriving in Cleveland in time for early afternoon delivery. The load is about 16,000 letters. In other words 16,000 letters are now advanced one day from New York to Cleveland by the United States Aerial Mail. All the way across the continent and back the mail is being now expedited and advanced in a similar manner.

Weather conditions are exceedingly important in regular flying. It was only a few years ago when most of the flying was done during the still periods at dawn and sunset. That time has long since been passed and planes now fly by day or night. Developments are being made daily that will enable flying in all but the very worst of weather conditions, and at such times the other existing forms of transportation rail, motor cars and steamships will be delayed. The regular London-Paris Air Express flew on schedule when the Dover boats were not allowed to cross the channel. Probably every reader has been snow bound on a train. A heavy fast train is delayed as much if not more by snow obstructing the railway and obscuring the signals as a plane would be. It is exceedingly difficult to keep steam in a big fast locomotive in cold weather, whereas, aviation engines are designed to operate in the extreme cold of high altitudes. The cost of snow removal at the terminal fields is infinitesimal compared with keeping open the railways. Europeans point out the advantage in flying in the United States where a storm is charted and watched hourly for thousands of miles so its time of arrival, character and force can be predicted with extreme accuracy. This cannot be done in Europe as many of the storms come in an hour or so from the sea or from over a foreign country.

Aeronautical Digest

Published Monthly

THE AERONAUTICAL DIGEST PUBLISHING CORPORATION
342 MADISON AVENUE
NEW YORK

Vol. 1

OCTOBER, 1922

No. 7

THE fact that Major Blake and his associates only covered one-fourth the distance of 23,000 miles in their first attempt to fly around the world from London, on account of a forced landing in the Bay of Bengal, that Capt. Hinton is detained in Haiti on his flight from New York to Brazil making changes in his motive power, and that Capt. Amundsen has not yet attempted his flight over the North Pole on account of lateness in the season in starting, need not discourage those who believe that in the future three-quarters of the transportation now by land and water will go through the air.

It was a long time from the birch bark canoe to the ocean greyhound; yet a moment of time only, relatively speaking, from the invention of aircraft to the flights of the Australian aviators from London to Australia, the Italian aviators from Rome to Tokio; the French aviators from Paris to Saigon, in Indo-China; the Dutch, German, French, English, Italian and Russian aviators in the remarkable European commercial flying; the English aviators in making their flight across the Atlantic in one hop; the American aviators in first flying across the Atlantic; the aviators of the Air Mail Service of the United States covering two million miles of flight with a high percentage of perfection; the American aviators flying across the United States with only one stop, to Alaska and return from New York; the inestimable value of the work accomplished by the American and Canadian aviators in forest fire, patrol and protection; and if space would permit, many other practical demonstrations in aerial navigation could be mentioned.

We will allow the readers of AERONAUTICAL DIGEST a respite to prepare them for the aeronautical revelations of 1923 which will astonish the entire world.

The subject chosen by a Baptist clergyman in Lowell, Mass., for the first sermon ever preached before a telephone forty-four years ago, and transmitted to subscribers in the city, and to a neighboring city forty miles away, on a telegraph wire and before the construction of long distance wires, was "Can ye not discern the signs of the times"?

It is considered an attempt to commit suicide to jump off Brooklyn Bridge, and a person performing this stunt is subject to criminal prosecution. A law should be passed to prevent aeronautical stunts; not only is the pilot guilty of an attempt to commit suicide, but the passengers are victims of an attempt at manslaughter.

The large amount of space given to the aeronautical movement by the press of the world indicates that the interest in the advancement of this great science is rapidly becoming universal, and is now receiving the class of support given in the early days to the upbuilding of the telegraph, telephone, railroad and steamship service.

The magnitude and importance of the Aeronautical Meeting at Detroit, October 7-14, 1922, cannot be more emphatically stated than by quoting from the advertisement of the parties directly interested in the affair appearing in the September issue of AERONAUTICAL DIGEST.

"The National Airplane Races at Detroit will bring together the greatest aggregation of flying craft in aeronautical history.

"The United States Army Air Service and the Navy Bureau of Aeronautics have confirmed entry of more than fifty of their latest and fastest planes.

"All kinds of civilian machines will be seen at this flying show which will also include the

"Detroit News Aerial Mail Trophy Race for large capacity, multi-motored planes, October 12th.

"The Aviation Country Club of Detroit Trophy Race for Light Commercial planes, also October 12th.

"The Liberty Engine Builders' Trophy Race for observation type (2-passenger) planes, October 13th.

"Other Aerial Contests and Exhibitions, \$10,000 in cash prizes, \$30,000 Gold and Silver Trophies.

"The events start with the Curtiss Marine Flying Trophy Race, October 7th and finally the Pulitzer Trophy Race, October 14th, internationally recognized as the speed classic of the world."

The situation will be strengthened from the fact that practical demonstrations of the use of aircraft will be made in the long distance cross country flights to and from Detroit from the most distant sections of the United States.

The field contest showing the speed and qualities necessary for aircraft construction for military, naval and endurance purposes will be valuable to the manufacturers, *but any flying with the useless freak machines and the stunting, if permitted by the managers, will seriously retard and damage practical aeronautics, and discourage the investment of capital in commercial aviation;* on the other hand, the sane, safe cross-country flying will do much to advance aviation and encourage a general use of aircraft.

The automobile track races for the Vanderbilt Cup were a necessity, the builders of automobiles were quoted as saying, for mechanical reasons, but did not create a demand for freak automobiles consisting only of a "chassis." The cross-country tours, however, of the American Automobile Association for the "Glidden Trophy," (eight years), created a demand for automobiles which the manufacturers were unable to keep pace with for a period of ten years, and did much to cause the building of good roads—an everlasting monument to the promoters of this class of contest.

Representatives of the National Air Association, the Aero Club of America and a Committee of five hundred nationally prominent men in all sections of the country are co-operating in the preliminary work of the Second National Aero Congress to create a permanent aeronautic organization which shall represent the thought and echo the voice here and abroad, in all fields of business and in the halls of municipal, state and national legislatures.

The people of the United States demand a national organization for the purpose of advancing aeronautics and the National Aeronautic Association will be formed with a large and enthusiastic initial membership consisting of progressive representative men from every section of the country.

This movement alone assures commercial aviation to the principal points of the United States before the close of 1923.



One of Rotterdam's big docks. (Photograph taken by the K. L. M. Dutch aerial operating company.)



The peace palace at The Hague. (Photograph taken by the K. L. M. Dutch aerial operating company.)

ENTITLED to HIGHEST COMMENDATION

Under the above caption *AERONAUTICAL DIGEST* will publish in each issue the names of men enrolled in the *AERONAUTICAL HALL OF FAME*. Men throughout the world who are influential in advancing aeronautics and encouraging the use of aircraft will be entitled to enrollment.

Readers of *AERONAUTICAL DIGEST* are requested to send in the names, full addresses, photographs, and statement of present activities of persons entitled to be enrolled. Address, Hall of Fame, *Aeronautical Digest*, 342 Madison Avenue, New York.

AERONAUTICAL HALL OF FAME

Warren G. Harding, President, U. S. A.
His Majesty the King, Great Britain.
His Majesty the King, Belgium.
His Majesty the King, Denmark.
His Majesty the King, Siam.
His Majesty the King, Spain.
His Majesty the King, Sweden.
His Majesty the King, Italy.
Ames, Dr. Joseph A., U. S. A.
Amundsen, Capt. Raold, Norway.
Arnott, Charles, Australia.
Ariza, Hon. J. B., Dominican Republic.
Bailey, Dr. Chas. A., Salvador.
Baker, Seymour C., Nova Scotia.
Becquet, Lieut., Belgium.
Bey, Abdul Hammed, Turkey.
Beynet, Eugene, France.
Blake, Major W. T., Great Britain.
Bowring, Capt. Wm., British West Indies.
Brackner, Maj. Gen. Sir, W.S., K.C., B.
A.F.C., Great Britain.
Bradshaw, Frank, Newfoundland.
Breen, J. L., Australia.
Brennan, Louis, Great Britain.
Brownback, Lieut. H. L., U. S. A.
Bruce, Walter S., U. S. A.
Butler, Capt. Harry J., Australia.
Beaumont, Commodore Louis D., U. S. A.
Carpenter, Clinton R., U. S. A.
Carrel, Hon. Frank, Canada.
Cassell, James C., Jr., U. S. A.
Castillo, Senor Jose A., Ecuador.
Cecek, Gen. Stanislaw, Czechoslovakia.
Chirifa, Col. Adolfo, Paraguay.
Clark, W. G., U. S. A.
Clark, Milton C., China.
Conde, Sr. Don Joaquin G., Mexico.
Coningsby, Major H. R., M.I.A.E., M.I.
Ae.E., South Africa.
Corbin, H. W., U. S. A.
Coulter, Dr. John Lee, U. S. A.
Cowie, R. E. M., U. S. A.
Crook, John, Esq., Jamaica.
Curiel, A. E. C., Dutch Guiana.
Curtiss, Glen, U. S. A.
Colton, Major Sydney, Canada.
Cutzjar, Capt. A. Zammit, Malta.
Coffin, Howard E., U. S. A.
Damme, M. H., India.
Davis, Hon. J. Wood, British Guiana.
De Cantruy, Mario Rebas, Honduras.
De La Fargue, Baron, Tunisia.
De La Llave, Don Joaquin, Spain.
Dederick, George L., Poto Rico.
Denby, Hon. Edwin, U. S. A.

Dennis, William H., Nova Scotia.
Dillingham, Walter F., U. S. A.
Dinshaw, Hormusjee Cowasjee, M.V.,
O.O.B.E., Arabia.
Dines, Tyson S., U. S. A.
Dowdell, Hon. S. H., Hongkong.
Dolz, Dr. Richardo, Cuba.
Duguid, Major Allen A. F. E., India.
Dumont, Alberto Santos, Brazil.
Duncan, W. H., U. S. A.
Durham, Major G. C., Zanzibar.
De Lacerda, Dr. Mauricio, Brazil.
De Sarigny, Lieut. Col. Vicomte Rene,
South Africa.
De Valenzuela, Ulpiano A., Colombia.
Hon. Secy. Auto. Assoc., East Africa.
Erogius, Consul Ernst, Finland.
Espinosa, Sr., Don Paul, Panama.
Eustis, Harold C., U. S. A.
Farnsworth, Joseph E., U. S. A.
Faulkner, H. L., Esq., U. S. A.
Ferguson, Dr. John C., China.
Ferguson, Wm. G., U. S. A.
Fichardt, Hon. Arthur E., South Africa.
Fisher-Smith, Sir Geo. H., Great Britain.
Fogg, R. S., U. S. A.
Fokker, A. H. C., Holland.
Foster, Randall, U. S. A.
Frazar, E. W., Japan.
Fretwell, Frank M., U. S. A.
Froisland, Frois, Norway.
Froom, Hon. A. H., India.
Fullam, Rear Admiral W. F., U. S. A.
Fuld, E., Holland.
Gage, Louis R., Indo-China.
Gardner, Major Lester D., U. S. A.
Garrel, The Rt. Hon. Lord, Great Britain.
Genton, Maurice P., Martinique.
Glass, Austin O., Indo-China.
Hall, James Norman, Tahiti.
Horsfall, Abram, U. S. A.
Hawley, A. B., U. S. A.
Henderson, Charles H., Maylaya.
Hipwell, Dr. A. L., France.
Hinton, Capt. Walter, U. S. A.
Hitchcock, Hon. Frank A., U. S. A.
Howard, Lee, U. S. A.
Howard, W. H. L., U. S. A.
Pres. Aero Club, Italy.
Secy. Aero Club, Italy.
Jacobs, Fernand, Belgium.
Jennings, H. H., U. S. A.
Johnson, A. H., U. S. A.
Jordan, Col. John A., U. S. A.
Kitchener, Major H., Bermuda.

(Continued on page 164)

Pilots of the Air Mail Service for the wonderful efficiency maintained by them in the transportation of mail under all conditions of weather, winter and summer over mountains, rivers and valleys.

Officers and men of the U. S. Air Service making a cross-country flight in the Navy balloon C-2 which shall greatly contribute to realization of the many advantages offered by the lighter-than-air in long distance flights.

Aeromarine Airways, Inc., for the splendid record established this summer over the Cleveland-Detroit line where more passengers were carried than over any other line in Europe during the same period of time.

Promoters of the great aeronautical Detroit meet, which shall take place at the beginning of this month.

Organizers of the National Aeronautical Association for their untiring efforts in organizing a meeting which shall be attended by five hundred delegates, this month in Detroit.

Col. Paul Henderson, 2nd Assistant Postmaster General in charge of transportation for the splendid record made by the Air Mail Service which is now nearing the two-million miles mark, which have been flown without a single delay worth mentioning.

Promoters of Civil Aviation Activities in the United States, the worthy successors of and men of the same calibre as those who organized our present railways and telephone system. The organization of commercial aviation in this country is a task worthy of such men and these men are worthy of the undertaking.

Scientists, designers and pilots in Germany who have made possible motorless flying. German science and German ingenuity once more commands the respect of the world.

The press and aeronautical organizations in Italy for their untiring efforts in boosting commercial aviation developments in Italy worthy of the high standard of Italian aircraft and Italian pilots.

European commercial aviation lines for the increased efficiency record which they have made for themselves during last summer.

To the Eminent American Basso
CHARLES LAIRD.

King Of The Air

Con spirito

Words and Music by
CLINT. R. CARPENTER



Voice

'Tis a won-der - ful thing to be a King, Not a mon-arch of Roy - al



birth, But a sov-reign of Air, in a realm so fair, That



cov - ers the wide wide Earth. That cov - ers the whole wide



Earth. In my ship so light, by day or by night, I

hold to my course on high, No fear do I know, where - 'er I may go, For a

King of the Air am I, ^(am I) a King of the Air am I. 'Mid the

light - ning's flash and the thun - der's crash, When the dark clouds gath - er

con fuoco

ff

King of the Air - 4

low; I speed a - bove in the ship that I love And out of the storm I

Slower

go, — And out of the storm I go; — In my

King - dom bright, I take my flight, Thru' the lanes of the az - ure

R. 2.

sky, — With ev - er a song as I glide a - long, For a

Tempo I

marcato

King of the Air am I, A King of the Air am I 'Tis a

f.p.

pomposo

glori ous thing to be a King, And hold to my course on high, No

rall.

fear do I know, Where'er I may go, For a King of the Air am I; A

allargando

King of the Air am I

King of the Air - 4

PROGRESS AND COMMENT

MAJOR GLIDDEN'S REMARKABLE TOUR OF THE WORLD WITH THE AUTOMOBILE

Countries	Miles
1. Afredis	41
2. Annam	Crossed frontier
3. Australia*	2,109
4. Austria	627
5. Bavaria	295
6. Belgium	160
7. Bohemia	315
8. Burmah	509
9. Canada	1,251
10. Ceylon	1,334
11. China	308
12. Cochin China	652
13. Denmark	306
14. Egypt	640
15. England	3,976
16. Fiji	200
17. France	5,495
18. Germany	1,546
19. Greece	944
20. Hawaii	30
21. Holland	435
22. Hongkong	170
23. Ireland	1,510
24. India	4,345
25. Italy	1,253
26. Japan	1,122
27. Java	1,250
28. Mexico	753
29. Monaco	35
30. New Zealand	1,145
31. Scotland	1,458
32. Spain	30
33. Strait Settlements	303
34. Swat	21
35. Sweden	1,540
36. Switzerland	1,097
37. Syria**	797
38. United States	7,977
39. Wales	549
Total	46,528

*Includes Tasmania.

**Includes Palestine.

When this tour was conceived many people said it was impossible. Recent progress in the aircraft industry makes it possible to accomplish the above tour by aircraft.

This automobile tour occupied the better part of eight years; with aircraft allowing for stops to see the country, it can be made in eight months.

The Following Is an Abstract on the Around the World flight, from Mr. E. W. Frazar, World's Board Commissioner for Japan and Corea, which appeared in *Japan Advertiser*, Tokyo.

After having covered more than 7,000 miles in their flight around the globe, the longest airplane trip ever attempted, Major W. T. Blake, the daring British aviator, and his two flying companions have abandoned their world flight due to their

inability to secure a new seaplane for their plane wrecked a few days ago, off the coast of the Bay of Bengal near the city of Chittagong, India. The flyers will return to England immediately.

The information that this the first attempt ever made to fly around the world has failed was received here yesterday morning by Lieutenant-Colonel Louis E. Broome, a member of the party of world flyers when they hopped off from Croy-

don, England, May 24, who came to the Orient to make arrangements for the flight from Yokohama to Vancouver. The cable message received by Colonel Broome gives few details of the situation.

It is impossible to replace this plane in India and to wait until another has been sent out from England would so greatly delay the party that they would be forced to attempt to fly over the most difficult part of the journey in the most unfavorable season of the year, according to Colonel Broome, who states that this is impossible. Consequently the flight has been abandoned. The British aviator now in Tokyo states that to attempt to fly over the Pacific later in the year than early September would be suicidal due to the heavy fogs which exist practically all the time over the Northern Pacific and also because of the high winds which may be expected a great part of the time.

Major Blake upon his arrival at Calcutta was forced to undergo an operation for appendicitis. He abandoned the trip and instructed Captains Macmillan and Malins to proceed in the seaplane which was there waiting for them and which was to have been used as far as Vancouver. When they were near Chittagong and flying over the sea they were overtaken by a strong wind and the machine was wrecked. They were forced to float about on the waters of the Bay of Bengal for several hours, but were finally picked up by a passing ship and taken to Chittagong. As soon as Major Blake sufficiently recovers the entire party will return to England.

Colonel Broome arrived in Japan a week ago yesterday, coming by way of America. He had completed all arrangements for the flight of his companions across Japan and the Northern Pacific Ocean and had they been able to come this far they would have found every detail of their flight in this part of the world carefully worked out. Full equipment for their flight through northern latitudes would have been awaiting them in Yokohama.

Prominent among the materials prepared for the men had they started across the Pacific by way of Kamchatka, the Kommandorski Islands, the Aleutian Islands and South-East Alaska is a map 30 feet long and 18 inches wide which shows in details every bit of water the aviator would have to pass over, every island and stretch of mainland in the vicinity and every little bay and inlet into which the aviators might have reason to enter. This detailed chart, which would have been the guide book for Captain Macmillan and Captain Malins in this part of the world,

was prepared by Colonel Broome while he was enroute to Japan. It is the only one of its kind in the world and is to the scale of one to a million, one inch upon it representing 15.7829 miles of the land which it pictures.

Had the chart been used it would have been torn to pieces as the plane progressed. It is mounted on a short stick and rolled. As the pilot directed the course of the plane and unrolled the map as they went along he would have torn off the used portion. When the party arrived at Vancouver there would have been nothing left but the stick to which it is attached. The map was made by taking 12 ordinary maps of this area, all of which were drawn to a different scale. They were reduced to a common scale and then enlarged to the desired scale.

In addition full equipment in the way of clothing for the flyers, safety devices of several kinds, arrangements for distributing fuel and the chartering of a special trawler which was to have proceeded across to Vancouver along the same route as the flyers were provided. Spare parts

for the plane have been provided and full plans made for supplying an adequate amount of high grade fuel. Two sleeping bags had been ordered for use in the cold regions.

Meets Cordial Support Here

A collapsible boat was also to have been carried in the big Fairey plane had it hopped off from Japan. It is six feet long, weighing only six pounds, capable of carrying four persons. It is made of the finest grade of silk and is carried in the fusilage of a plane. Distress signals had also been provided which were brought here from America.

Colonel Broome states that he has met with the greatest support from all sources in Japan in preparing the arrival of the flyers in Japan. The Japanese government has played a leading part in supporting the arrangements being made and has placed several high officials at the command of Colonel Broome to help with the work in hand. Every agent at the command of the Government has been offered to help make the proposed flight a success. Officials at the British

Embassy have also taken a large part in the preparations. Captain Colvin, Military Attaché at the embassy, returned from his vacation and has given his entire time to the matter.

The directors of the Mitsubishi Company have also shown every courtesy to the British airman. He states that every resource of the company was offered in case it was needed. It was this company that arranged for the special trawler which Colonel Broome was to have used in his cruise to Vancouver. Mr. A. P. Scott of the Rising Sun Petroleum Company aided in completing plans for the supply of fuel for the plane. Mr. E. W. Frazer has advised in regard to plans for the flight through the Kurile Islands and the Kamchatka coast. He knows these regions intimately due to his long business experience in this part of the world. He also supplied an office in which Colonel Broome has done a great part of his work since his arrival in Japan.

The cost of the flight thus far is estimated at approximately \$90,000 and Colonel Broome states that \$45,000 more would have financed the trip had it been



Major and Mrs. Glidden arriving at Vancouver after a drive of 1803 miles on the tracks of the Canadian-Pacific Railway en route around the world.

possible to complete it. The money for the entire undertaking has been supplied by a British sportsman out of his love for a sporting event and his interest in the development of aviation. According to Colonel Broome, the only condition upon which the wealthy Englishman would agree to finance the flight was that his name should not be made public. He is reported to be one of the most prominent sportsmen in England and his name is well known in all parts of the world.

Is a Sporting Event

That a similar attempt to circle the globe by airplane will be made next year is a certainty, Colonel Broome believes. It is extremely possible, he thinks, that the honor of making the first world flight may develop into a race next year, as several interests are likely to carry out that attempt. He says other aviators of great experience are anxious to begin such a flight and that by next year several such men may come forward and stage one of the most exciting sporting events in the history of the world. That the sporting element plays a large part in such an undertaking the world flyer declares there is no doubt, and he believes indirectly it will do more toward further developing aviation than any other factor barring the purely technical side.

In speaking of the significance of the flight and the impetus which it will give aviation in general, he believes that it has done more than will be generally recognized at present. He says that the interest of the world has been centered upon the undertaking and that the press has been full of it since it began. As the men proceeded the interest steadily increased, and if it had been completed it would have been widely discussed in every land, resulting in many new developments in aviation. The experience that the men in this flight have obtained is of the greatest value, he thinks, and will make such an undertaking next year much more sure of success than has been the case this year.

The arrangements which have been made in Japan will be cancelled as far as possible. The machines which have been stationed in America will be kept there at least temporarily. There is now a DH9 machine at Vancouver for the flight from there to the Atlantic Coast and there are three flying boats at Winnipeg. These have been provided and cared for by the Canadian Air Force, by which the arrangements for the trip across America have been made.

In preparing to leave Japan Colonel Broome states that next year the world flight will undoubtedly be carried out. He says the flight will be started earlier in the year than was done this season. From the general widespread support which the men have received this year Colonel Broome declares the flight cannot fail if adequate arrangements in any degree are made in advance.

Major Morgan, the British aviator who is to attempt a Pacific flight from San Fran-



Lieut. Walter Hinton, U. S. Navy, who is now attempting the flight to Brazil.

cisco to Sydney, New South Wales, for a £10,000 prize offered by Thomas Ince of Los Angeles, has already planned his route.

Starting from the Californian port probably on October 2, Major Morgan hopes to make a non-stop sea flight to Honolulu, a distance of 2,080 miles.

"No floats will be fitted to the machine," Major Morgan told a reporter recently. "It will, however, be so constructed that it will float on the water if necessary. We have permission to use the American Army aerodrome at Honolulu and we shall spend a day there. If we leave San Francisco, as we hope, at 7 o'clock in the evening of Monday, October 2, we expect to arrive in Honolulu at 1:30 P. M. on Tuesday, a flight of eighteen and a half hours.

"We should leave Honolulu at 7 o'clock on Wednesday evening, and after passing the Palmyra Islands, thirty miles to the west, and the Fanning Islands, reach Samoa across 2,250 miles of sea at 2 P. M. on Thursday.

"This will be the most testing part of our flight. If all goes well we shall leave Samoa again at 8 A. M. on Friday for Fiji, a distance of 640 miles, which we hope to reach at 1:30 P. M. Leaving Fiji at 8 o'clock the same night and passing over Noumea, New Caledonia, at 2:30 in the morning, we reckon on picking up the Australian Coast at Brisbane at 9 o'clock and arriving at Sydney at 1:30 P. M. on Saturday.

"In all the flight will be a little less than

7,000 miles and we are hoping to cover it all at an average speed of 120 miles an hour. We shall have on the machine a wireless direction finder by which I shall be able to get my position at any time from various wireless stations and from ships at sea. Our wireless will enable me to listen to Sydney talking to me all the time of my flight, though I shall not be able to reply, as our apparatus is not sufficiently powerful."

Major Morgan will be accompanied by Captain Haslam, an Australian aviator and wireless operator.

Captain Hinton and party, flying from New York to Brazil, have arrived in Haiti.

Captain Guest, (British Secretary of Air), states that the Government's policy is to concentrate on the maintenance of the Continental Air Service as a demonstration of what was possible in competition with rail and sea transport. It was too soon yet to gauge the success or otherwise of the present subsidy scheme, as it had only been in operation a few weeks.

Trips to India by air in three days at a cost of \$300 first class and \$175 second class may soon be offered British travelers. A number of large technical corporations have made a proposal to the Government to run a mail and passenger

service from London to Bombay. The airships would have a capacity of 5,000,000 cubic feet and would be capable of flying at eighty miles an hour with 200 passengers.

The proposal has been put forward in order to develop the communications of the British Empire in speed and cheapness, and thereby assist the development of trade.

Hon. W. R. Farrington, Governor of Hawaii, writes:

"I have received your letter of July 15, also copy of the 'Digest' for August.

"I am heartily in sympathy with your effort to rouse the people of the United States to a greater interest in the commercial value of aviation. I believe that the fleets of the air serve the same dual purpose in the protection of our National interests that is enjoyed by the fleets of the ocean under the command of the United States Navy and the leaders struggling to maintain our American Merchant Marine.

"There is no doubt that transportation by airship can be made safe and efficient. This can be accomplished through good business management. When aviation enterprises are honestly organized and adequately financed they deserve the support of governmental agencies.

"On account of these Islands being a military and naval outpost, all aviation activities properly come under very strict governmental supervision.

"The development of an air mail service under auspices of the Government would be of inestimable value in the Territory of Hawaii.

"It is important that we should have in this Territory a large aviation force."

Major R. Carr, air scout of the Quest, the ship of the Shackleton-Rowett expedition to the Antarctic, has returned to London reporting on the possibilities of Polar exploration by air.

"I am fully convinced that in future Polar exploration will be done by aircraft," he said. "During the Summer months very few people realize how mild the Arctic and Antarctic Summers really are. The airship of today is capable of doing the trip to the North Pole and back from London, a distance approximately 4,580 miles, within a week. Fuel for the whole distance could be carried and no landings need to be made."

Owing to the late Sir Ernest Shackleton's change of plans the Quest did not call at Cape Town on the voyage out for an Avro airplane, which Carr intended to use. Nevertheless, Carr made a number of observations on flying conditions in the Antarctic. The report he has made is addressed to J. Quiller Rowett, who financed the expedition.

"During the seven weeks we were in the ice," he says, "the lowest temperature recorded was 5 degrees Fahrenheit, and the average was approximately 20 degrees. The wind average was 8 to 10 miles an hour, and the air and sky were

wonderfully clear. The records I kept showed we had more than three hundred perfect flying hours. In conditions such as these an airplane could have been used without difficulty and valuable work could have been done."

Air travellers in Europe may now listen to radio music flashed from ground stations. Thus as the fliers passed over Burgundy they heard an aria from "Carmen."

The Aeronautical Chamber of Commerce of the United States was organized this year to "foster, advance, promulgate and promote aeronautics, and generally to do every act and thing which may be necessary and proper for the advancement of American aviation."

Starting with Orville Wright and Glenn H. Curtiss, the pioneers, and several other leading aircraft designers and builders, the chamber now has nearly 200 members located in every State in the Union.

Possibly a score of factories today have their own laboratories in which scientists are working with trained personnel making slight alterations in machines or motors, the chamber says in a statement given out in this city. These men are not seeking to produce something radical, but rather to improve the types which have justified the basic principles on which they were built.

Approximately 500 civilians have taken lessons in flying at civilian aviation fields this summer. The chamber estimates that there are 1,200 civilian owned and operated aircraft in the country today.

The average charge per passenger a year and a half ago was 65 cents a mile. Last year it was 55 cents, and it is believed that the average this year will be about 50 cents. There has been a slight increase in terminal facilities so far this year. The Administration is encouraging local landing fields and national airways wherever practical.

The time table issued by the Lloyd Luftdienst, or Air Service, of Bremen, reads like a chapter from Jules Verne. It offers information concerning all the existing air lines in Europe and contains a map of these routes which is surprising in the evidence it affords of the growth of air transportation abroad. There are now twenty-four companies operating air service in Europe. They make landings in fifty cities in Great Britain, Spain, France, Germany, Belgium, Holland, Denmark, Sweden, Switzerland, Poland, Czechoslovakia, Austria, Hungary, Russia and Rumania.—New York Herald.

Railroad strikes, delayed train schedules, etc., are matters which give General William Mitchell, Assistant Chief of Air Service, little concern whenever he has occasion to travel on official business. It makes little difference whether his destination is Langley Field, Mitchell Field, Dayton, or points as far West as Milwaukee, Wis., for his popular vehicle of transportation is the airplane, and he ac-

complishes his various missions in a fraction of the time he otherwise would by ordinary means of travel—the railroad, steamboat, or automobile. It is estimated that the General has flown approximately 200,000 miles since his return to the United States soon after the close of the war. During this period he has traveled on a train only twice.

Following on the Congrès International de la Navigation Aérienne, held in Paris in November, 1921, it is proposed to hold a similar congress in London towards the end of June next year. Group-Capt. H.R. H. the Duke of York, K.G., G.C.V.O., R.A.F., has consented to become President of the General Council of the Congress, and the Rt. Hon. the Lord Weir of Eastwood, P.C., has accepted an invitation to become a Vice-President. A strong Organizing Committee, representative of all phases of British aeronautical activity, including the Air Ministry, has been formed, with His Grace the Duke of Sutherland as Chairman.

A table has been prepared by a British engineer, showing relative cost of transport by various means. Naturally, it bears witness to the rule that cost goes up with speed, although there are some interesting exceptions. The figures show the cost of transport of one ton per mile:

Barge, average speed 1 mile per hour one-tenth of 1d.; tramp steamer, 7½ m.p.h., one-half penny; goods railway trains, 15 m.p.h., one penny; London motor omnibus, 10 m.p.h., 4d.; electric passenger train, 25 m.p.h., 4d.; pedal bicycle, 7 m.p.h., 5d.; passenger train (steam), 40 m.p.h., 6d.; Ford touring car, 18 m.p.h., 8d.; motorcycle and sidecar 21 m.p.h., 1s. 2d.; coolie (British East Africa), 2 m.p.h., 1s. 10d.; liner (third class), 12 m.p.h., 2s.

London taxicab, 14 m.p.h., 3s. 4d.; liner (first class), 12 m.p.h., 4s. 5d.; London-Paris airplane, 100 m.p.h., 6s. 8d.; letter by post, 17 m.p.h., 11s.; Rolls Royce car, 22 m.p.h., 20s.; U. S. A. airplane service, 90 m.p.h., 20s.; Junkers all-metal airplane, 100 m.p.h., 20s. 3d.; two-engine airplane, 80 m.p.h., 30s. 10d.; airship (rigid), 30 m.p.h., 36s.; Cairo-Bagdad airplane, 100 m.p.h., 40s.

Royal Air Force airplane in India, 100 m.p.h., 120s.; Royal Kemley-Paris service (in 1919), 100 m.p.h., 180s.

The figures, of course, are approximate; but many of them are based upon actual experience. Two curious items are: Hand barrow, at 1½ miles per hour, 6s. 10d., and postman, at three miles per hour, 97s. But these two include among the services rendered other matters, such as house-to-house delivery.

Another example of speeding important work in progress was the flight of an F-5-L, the large type of navy scouting airplane, to Philadelphia from Washington recently, when spare parts were urgently needed to carry on the work on new types of seaplanes now in progress at the naval air station at Anacostia.



Latest Handley Page aircraft used on the London-Paris aerial line.

Officials of the Bureau of Aeronautics are now using this method of transportation to accomplish duties in hours that in the past would have taken days to perform. Inspections of stations, rush orders to aviation personnel, and important communications are all carried out with a minimum of loss of time and a corresponding gain in efficiency and money saved.

Commercial Aviation in Europe may be summed up in general statements by Prof. E. P. Warner, which are the result of observations he made during the course of two thousand miles of air travel in England, France, Belgium, Holland, Germany, Austria and Czecho-Slovakia. The first is that every civilized government in the world that is not bankrupt, with the exception of the United States, is finding it worth-while to develop aviation. At the back of their minds is the military necessity for proper aerial defense. Nearly all grant subsidies, the French being the heaviest and the English about the lightest. Even in Austria, in the last stages of financial collapse, a new air operating company is being planned. The second is: it has been shown that if a commercial aviation enterprise is operated solely as a commercial undertaking, without regard for possible military use, and applying the same methods of sound business management as would be required of any ordinary activity, there is every prospect that it can

be made to stand on its own feet. As an example of what can be done, one English line during June made 84 trips between London and Paris, with only one airplane. This machine travelled a total distance of 19,000 miles, with only one forced landing, and that due to fog. Twenty trips were made in five days, or an average of 900 miles each day, which meant about ten hours of flying daily. During all this, the advertised schedule was maintained. One English company is operating successfully without subsidy.

Interesting experiments have been carried out on the Paris-Orleans Railroad by which engineers receive wireless communications. A receiving post having been rigged up where there is an electric light installation and the car being used as antennae, they are able to intercept messages from the new French station at Saint Assise. The result is declared to be very satisfactory and wireless engineers state that by means of special antennae attached to the roof of a car it will be possible to receive wireless telephone messages without difficulty.

Brig.-Gen. William Mitchell, assistant chief of the United States air service, has just announced that within two months or less the United States will have in operation ten pursuit planes, all of them of novel types, which he expects to be the fastest fliers in the world.

Don Hogan arrived at Packard Field after completing a trip of 1,175 miles from Denver by way of Chicago by airplane.

He was met there by Capt. Eddie Rickenbacker and officials of the Rickenbacker Motor Company.

General Extension of British Air Lines is announced for 1923 to Switzerland, Germany, Prague—across Europe to Bagdad.

The New M-873 Engine Produced by the Aeromarine Airways, Inc., at their factory in Keyport, N. J., is attracting the attention of engineers and builders of aircraft throughout the world. Under a test supervised by officials of the U. S. Navy and others the engine ran 300 hours.

In the Navy test, U-873 did equivalent in energy to lifting one ton to a height of 1,270 miles. Sixteen tons of gasoline, or 5,300 gallons, were used in the test, or about a gallon to $4\frac{3}{4}$ miles. The average oil consumption was .0086 pounds per horsepower per hour. The engine made 31,000,000 revolutions in the 300 hours and the distance travelled by the propeller tip was equal to about a third of the distance from the earth to the moon, or 91,200 miles. The water pump circulated 2,726 tons of water to cool the engine.

And the next Aeromarine engine called U-873 will be rated at 250 horsepower,

AIR MAIL OF THE WORLD

THE AIR MAIL SERVICE IN THE UNITED STATES

By COL. PAUL HENDERSON

Second Assistant Postmaster General, in Charge of Transportation

The Air Mail Service is limited by law to one Transcontinental route from New York to San Francisco. This route is 2,680 miles in length, making a round trip of 5,360 miles. This round trip is covered each day, except Sundays and holidays of the year. This necessitates an annual schedule flying on the part of our force of approximately 1,800,000 miles. The Eastern terminus of our route is Mineola, L. I.; the Western terminus, Presideo, San Francisco. The intermediate landing fields are as follows: Bellefonte, Pa.; Cleveland, Ohio; Bryan, Ohio; Maywood, Ill. (Chicago); Iowa City, Iowa; Omaha, Neb.; North Platte, Neb.; Cheyenne, Wyo.; Rawlins, Wyo.; Rock Springs, Wyo.; Salt Lake City, Utah; Elko, Nev.; Reno, Nev.

Our service at the present time consists of a relay advance of mail from New York across the Continent, and vice versa. That is to say, we do not take any particular mail for a complete trip across the Continent. We advance certain mail into Cleveland from New York, which misses the late night trains out of New York. We take from Cleveland into Chicago mail which, if we did not carry it, would go into Chicago on a train too late for delivery in the afternoon. This process is repeated in relays across the Continent with the net result that we advance approximately 12,000 pounds of first class letter mail each day, a matter of some three or four hours. It should be noted that this three or four hour advance may in certain instances mean a real advance of fifteen to eighteen hours, inasmuch as it may mean the delivery of the mail to consignee late in the evening, which might otherwise have not been delivered until the following morning. Each ship carries approximately 600 pounds of mail.

The planes which we are now using are remodelled De Haviland planes, which we procure free of charge from the Army. As of this date, we have 70 such planes in flying condition. Twenty are in the air each day and about 24 are in process of being over-hauled and rebuilt.

We use Liberty motors, also procured without charge from the Army. Our experience has shown us that at the end of 100 hours' flying service it is necessary to

over-haul each Liberty motor. This we do at an average cost of about \$250 per motor. At the end of 300 or 400 hours' flying service we over-haul the ships themselves. The major portion of this over-hauling and rebuilding is done in our shops at Chicago, which shops are rather complete and employ approximately 100.

From July 16, 1921, until September 7, 1922, we flew approximately 2,000,000 miles without a fatal accident. During the fiscal year ending June 30, 1922, we maintained an efficiency of 94.39 per cent. This means that out of every 100 trips scheduled, 94.39 were finished on schedule time. Our records show that $\frac{2}{3}$ of our trips were made in clear weather; $\frac{1}{3}$ were

made in foggy, cloudy or stormy weather.

A week ago last Saturday we finished 8 consecutive weeks of flying the entire Transcontinental route with 100 per cent efficiency; that is to say, during those weeks each of our scheduled trips was started and finished exactly on schedule time. It should be remembered that our daily route includes the crossing of three mountain ranges, the Allegheny Mountains, the Rockies and the Sierras.

There are employed in the Air Mail Service 390 people, of whom 39 are pilots. With three or four exceptions, our pilots are all ex-Army or Navy flyers. They are exceptionally high-grade young men, and to them is due much credit for the success of our Air Mail Service.

It is obvious that in order to get from the airplane all that it may offer in the shape of postal service it will be necessary to fly at night. With this thought in mind, we have for the past three months



Lieut. Col. Paul Henderson, Second Assistant Postmaster General in charge of transportation.

conducted an intensive series of experiments in a study of this subject. Our experiments have reached the stage where it is, I think, safe to conclude that it is entirely possible to fly at night. We expect within a few weeks to light, as an experiment, our Chicago Field, and I am personally optimistic enough to predict that within six or eight months we will be able to fly from Chicago to Cheyenne at night.

If we are successful in this it will mean that we will be able to make a Transcontinental flight from New York to San Francisco in one continuous movement, flying from New York to Chicago in the day time, Chicago to Cheyenne at night, and from Cheyenne to Frisco during the early part of the second day. We should be able to establish and maintain a schedule of from 28 to 30 hours between New York and San Francisco if this night flying experiment proves out.

Our plan for night flying includes an emergency landing field every 25 miles, with the proper field lights, and with a beacon light visible for a distance in excess of 25 miles.

We are proceeding slowly in this matter of night flying in order that we may assure our pilots of the protection to which they are entitled before we ask them to undertake night work.

It is my personal opinion that within two or three years the Air Mail Service will have developed to a point where it will undoubtedly be thought wise to turn over the service to private contractors and make it nation wide in its scope, with higher postage than is now charged on ordinary letters. I would like to represent that I do not think that the airplane should in any way be considered as a competitor to the railways in the matter of mail carrying. If the airplane is to feature in the future of our postal service, I believe that it should be thought of in the light of making possible a brand new type of service for which it should be expected the people should pay an additional postage.

Proposed Legislation in the United States.—Hon. Halvor Steenerson, Congressman from Minnesota, Chairman of the Committee on Post Office and Post Roads, and a strong supporter of an air mail service, has introduced in the House of Representatives the following

BILL—(H. R. 11193)

To encourage commercial aviation and authorizing the Postmaster General to contract for air mail service, and prescribing rates of transportation and postage thereon.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that this Act may be cited as The Air Mail Act.

Sec. 2. That when used in this Act the term "air mail" means first-class mail prepaid at the rates of postage herein prescribed.

Sec. 3. That the rates of postage on air mail shall not be less than 6 cents for each ounce or fraction thereof.

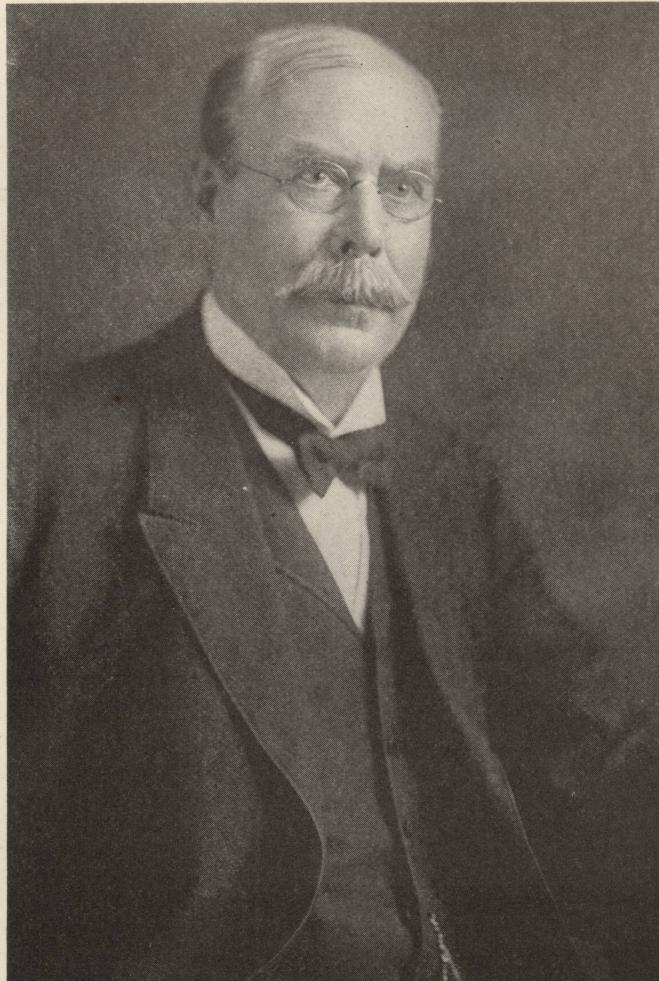
Sec. 4. That the Postmaster General is authorized to contract with any individual, firm, or corporation for the transportation of air mail by aircraft between such points as he may designate at a rate not exceeding 2 mills per pound per mile, and to further contract for the transportation by aircraft of first-class mail other than air mail at a rate not exceeding one-half a mill per pound per mile.

Sec. 5. That the Postmaster General may make such rules, regulations and orders as may be necessary to carry out the provisions of this Act.

Mr. W. G. Clark, consulting engineer of the American Air Transportation Co. (in process of incorporation), has suggested that the rate on air mail shall not be less than eight cents for each ounce or fraction thereof, and the suggestion is receiving favorable consideration.

Mr. Steenerson has favored AERONAUTICAL DIGEST with the following statement:

It has all along been the view of the Post Office Department that the government operated air mail service was simply an experiment and should be superseded by privately operated lines as soon as the art should be sufficiently advanced so that mail could be carried on a commercial basis, that is to say in competition as to price with other means of mail transportation. Expedition is an important element in the transportation of first class mail and where a material saving of time is attained by air as compared with railway service, a somewhat higher rate of compensation is justified. The proposed increase to six cents per ounce, provided for in the bill, it is believed would enable the government to pay the two mills per pound per mile without loss. Assuming the average haul to be one thousand miles the government would pay \$2.00 per pound to the carrier and would collect \$2.70 in postage, assuming 45 letters to the pound and six cents per letter. Should the average haul exceed 1,350 miles there would be a loss. If the change were made eight cents instead of six it would be certain to be sufficient to protect the government against loss. The mail on which no extra postage is paid may under the bill be carried but the compensation is only one-fourth of that prescribed for the "Air Mail" proper. This is considerably more than is paid to the railways, but if it will help in the beginning at least to secure an adequate load of the profitable matter, it is justifiable.



Hon. Halvor Steenerson (Minnesota), chairman of the Committee on the Post Office and Post Roads.

Many have asked me why my bill was not speedily reported and pressed for passage. The main reason, I believe, is the attitude of some of the pretended advocates of the bill who persisted in demanding rates and guarantees of a minimum load that would virtually involve the government in the payment of a subsidy to air mail carriers of millions of dollars annually. The purpose of the bill is to encourage air mail that will pay for itself, that will be no financial burden to the government.

We have a so-called transcontinental air mail line now, owned and operated by the government at a cost of \$1,900,000 per annum, without one cent of additional revenue. That is justified as a temporary experiment. The proposed contract service, on the other hand, is based on the idea that there will be enough extra postage collected on the expedited mail to make it self-sustaining. Those who demand more than this are injuring the cause of aviation generally. Its true friends believe it has sufficient merits to demonstrate that it can enter the field of mail transportation on a purely commercial basis and win.

U. S. Air Mail Service—Official report fiscal year ending June 30, 1922—(The world's greatest air mail service): Miles traveled, 1,727,265; percentage of performance, 94.39; number of letters advanced, 48,988,920; pounds of mail carried, 1,224,723; cost of service, \$1,215,167.01; average cost per mile, 70 35-100th cents. Line in operation New York to San Francisco.

Trans-continental Air Mail Service Recently Completed Five Weeks' Perfect Record of Operation. All three divisions reported their service had been flawless for this period. This is the best efficiency record the air mail service has made for all divisions since it has been in operation.

The operation of the air mail service is regarded as perfect when all the planes leave daily as scheduled and the mail is carried all the way to its destination by airplane.

The Air Mail Service in the Argentine Republic will operate over the line Buenos Aires, Azul, Bahia Blanca, Patagonia, San Antonio Oeste, Rawson, Comodore, Rivadavia, Rio Gallegos, Ushuaia. These are the recommendations which have been made by the Argentine Post-Master General.

The German Government Is Publishing a Review Known as the "Luftpost" for the purpose of educating the people at large, and particularly commercial firms, to the use of the air mail service. The Luftpost is sent free to public concerns located in places where the Government wants aerodromes to be built.

The Shipment of Mail by Air between Cairo and Bagdad Is Now Assured. A surtax of 1.25 francs for each twenty grams or fraction thereof is required besides the ordinary postage. All correspondence



The opening ceremony of the Northwest Aerial Mail Service, Western Australia. Major N. Brearley, D.S.O., M.C., A.F.C. (left); His Excellency the State Governor Sir Francis Newdegate (center); Miss Newdegate (right).

must be marked "By aeroplane care of Cairo-Bagdad." A saving of between seven to fourteen days is thus obtained.

The Aerial Mail Service Which Was Initiated on May 6 from Hamburg via Stettin to Danzig, Koenigsberg, Kovno, Riga and Moscow, has made a marked reduction in the time required for delivery of mails between Germany and Russia. The saving amounts to twenty-four hours in mail for delivery to Kovno, and thirty-six hours for mails to Riga. In addition there is a saving of five hours' time in the Danzig and Koenigsberg mails.

Within the Next Few Months we may expect to see the Adelaide-Sydney-Brisbane air mail service in operation, and we are assured that so far as the type of planes to be used and the landing grounds to be negotiated are concerned there will be nothing better to be desired.

The Palestine General Post Office has announced the inauguration of a fortnightly mail service by aeroplane from Palestine to Mesopotamia.

Temporary Air Mail Service Will Be Established from Cleveland to Detroit, New York to Hartford, and Omaha to Norfolk, Neb., during the next few weeks.

A Postal Air Service between Geneva, Nuremberg, Berlin, Koenigsberg and Moscow started on July 1st.

Preliminary Preparations Are Being made for the running of experimental air mail services between Pretoria and Cape-town by the South African air force.

Average cost per mile operating air mail in the United States has been reduced to 53 cents.

AIR MAIL

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AIRPLANES

Radical innovations in airplane building, based upon lessons learned from the bird, will mark the naval entries in the Detroit aviation races to be held in the early part of October.

The most notable of these innovations will be the navy "B-R" or Booth racer, which will contest for the Pulitzer Trophy.

Builders of airplanes, watching the birds, find the feathered flyers get their landing gear out of the way so as to present the least possible resistance to the air. Smaller birds tuck their feet away in their breast feathers, while the larger ones, such as ducks and geese, park their legs and feet among their tail feathers.

Accordingly, the Booth racer has been so constructed that when it leaves the ground the wheels of the landing gear will be withdrawn into the body of the plane.

The presence of the landing wheels has been a serious obstacle to balancing in flying, in addition to interfering with the speed of the plane. Cross currents of air striking the wheels cause loss of equilibrium.

A torpedo plane that will be the last word in aircraft construction will in all probability be obtained by the American Navy in the next few weeks. It will be evolved from competitive tests now under way at the Anacostia Naval Air Station under the supervision of Rear Admiral William A. Moffett, chief of the Bureau of Aeronautics of the Navy Department.

Three American torpedo planes have been entered in the competition. They were submitted by the Curtiss Airplane and Motor Corporation, the Stout Engine Laboratories of Detroit, and the Davis-Douglas Company of Los Angeles. The fifth competitor in the trials is the Blackburn "Swift" type of torpedo plane, which the British Air Ministry has been using. All the torpedo planes were subjected to severe tests before being brought to Washington for the official trials at Anacostia.

The first cross-country night flight ever made in an airplane from Washington to New York City was accomplished in five hours and fifteen minutes actual flying time by First Lieutenant Clayton Bissell of the army air service, one of the few

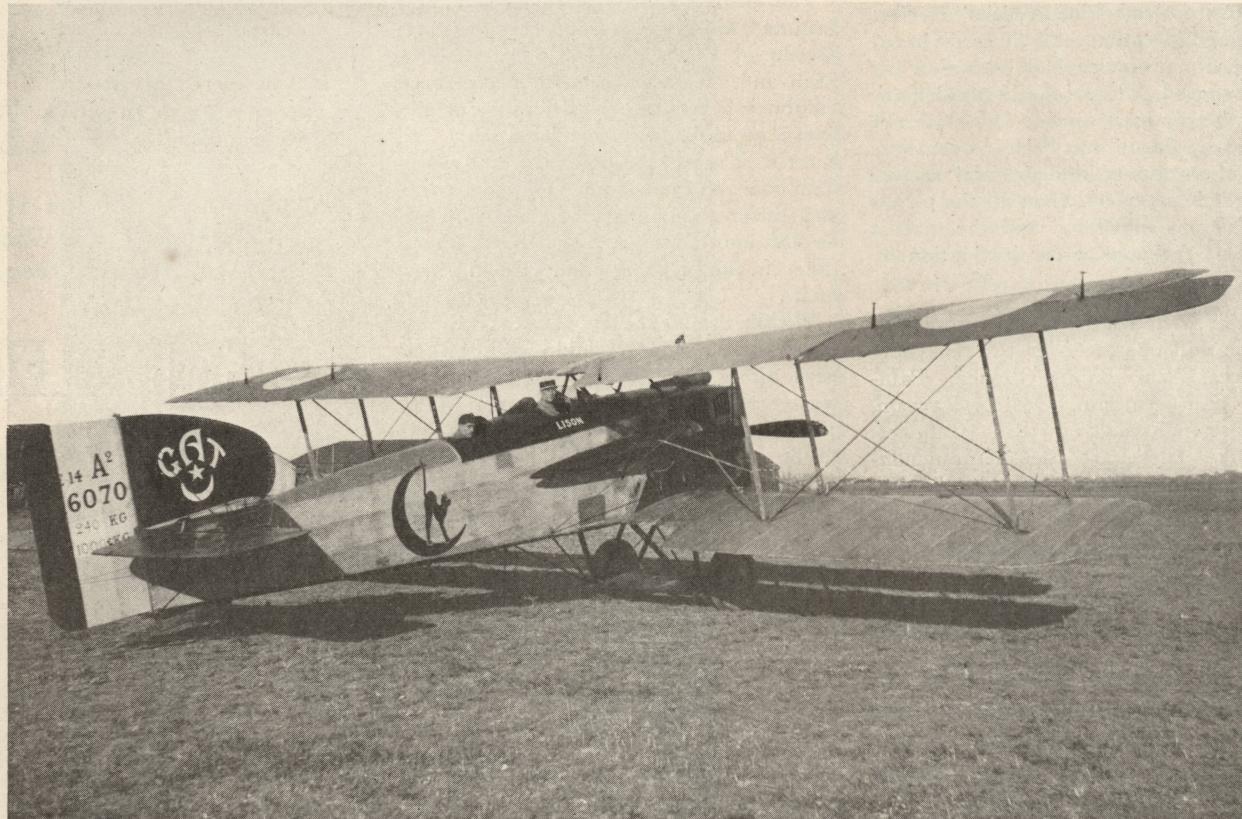
"aces" now on the active list of the regular army. The trip was made in a standard DH4-B airplane, leaving Washington at 9:30 o'clock in the evening and returning to Bolling Field at 4:25 o'clock in the morning. One stop only was made, at Mitchell Field, I. L., in the middle of the night with the aid of colored rockets and landing lights. The plane crossed Manhattan in the vicinity of Times Square.

Aboard Battleship *Arkansas* (via Norfolk), Sept. 27.—The science of naval warfare entered a new phase to-day when eighteen seaplanes firing torpedoes made a spectacular attack on the battleship *Arkansas* in a series of fleet maneuvers seventy-five miles off the Virginia Capes.

The planes, flying from a base in Hampton Roads, ninety miles distant, fired seventeen torpedoes at the battleship. Nine were hits. The battleship was traveling at seventeen knots in a zigzag course trying to dodge.

This is the first time in naval history that a torpedo attack has been made from the air, and the results are held by officers of the Atlantic fleet to be deeply significant.

—Special Dispatch to The New York Herald.



Breguet military airplane, piloted by Lieut. Pelletier-Doisy, of the French Air Service, which flew from Tunis to Paris.

SEAPLANES



"Savoia" hydroplane, Type S 51, equipped with Hispano-Suiza 300 H.P. motor, arrived second in the international competition for the Schneider Coup, recently held in Naples, Italy.

The Cleveland-Detroit air route of the Aeromarine Airways, Inc., has broken all records for passengers carried and reliability of service, running a double 80-minute flying service daily between Cleveland and Detroit for two months. Two 11-passenger enclosed cabin cruisers were used, 1,839 passengers carried, 222 crossings of Lake Erie accomplished; 2,574 pounds of freight were carried, including a Ford automobile, newspapers and merchandise.

The service has been increased and three cruisers will be used until late into October.

The Aeromarine Company is the largest aerial transportation company in the world operating flying boats. The white flying boats of this company also operate between New York and Atlantic City, New York and Havana, Cuba, Miami, Bimini, Nassau, Key West-Havana, Palm Beach-Havana.

During the past three years of commercial operations the boats of the Aeromarine Airways have flown more than a million passenger miles and carried thousands of people without a single mishap—a record unexcelled or even equalled by any other aerial transportation company.

"Seaplane" is a term employed to describe any airplane which can alight on the water. There are three main divisions—the float seaplane, the flying boat, and the amphibian, the last named having retractable wheels enabling it to land either on the ground or in the water.

Owing to the fact that a commercial seaplane need not have a very high "ceiling," having no hills to surmount, nor the need to climb to considerable heights so as to be within gliding distance of some landing ground, the power can be expended in load carrying, and consequently the seaplane should be capable of carrying a greater percentage of useful load. In other words, it should not require such a large subsidy to make it pay as does a fast land machine such as is apparently required on the London-Paris route. Furthermore, there are no special emergency landing grounds to establish, and no special lighthouses, the seaplane being able to make use of existing ones, as well as of the usual customs and passport organizations. All this points to a saving in expenditure on what we might term incidentals, which would mean that more money could be spent on improvements in the machines themselves.

It is no secret that the British want the distinction of being the first to fly around the world and this venture has the sanction of the Air Ministry which, according to the statement made by Capt. F. E. Guest, president of the Air Council, before the House of Commons, has a reasonable chance of success.

To accomplish this purpose, an expedition will be commanded by Capt. E. J. K. McCloskey, who hopes to start in October, but if this is not possible he will probably wait until spring. The official promoters of aviation are now anxious to prove that Sir Ross Smith's dream is plausible.

The whole flight will be made in one machine—a Fairey seaplane specially built and provided with a 600 horsepower Rolls-Royce engine and an inclosed cabin where the crew can be comfortable, with special provisions for tropical heat and arctic cold.

The start probably will be made from the Thames, whence the fliers will travel by way of Bordeaux, Athens, Bombay, Hongkong, Tokyo, the Aleutian Islands, Vancouver, America, New Foundland and the Azores.

Valuable data have been acquired from the Portuguese Atlantic fliers, who also used a Fairey seaplane. This has resulted in several improvements in the new plane. Its lifting power, including the fuel and crew, will be between six and seven tons. No effort to establish speed records will be made, but it is intended to complete the journey in three months.

It is announced that the seaplane floating dock, which has been under construction at Sheerness Dockyard to the orders of the Air Ministry, has now been delivered as ready for service. For the present the craft has been berthed in the Medway, near Port Victoria. The dock, which has an overall length of 143 ft., and a lifting capacity of 200 tons, will accommodate two large modern seaplanes; has thirteen buoyancy compartments; each flooded direct from the sea and emptied by blowing with compressed air. The power for the air compressors is supplied by two oil-driven dynamos, which also provide the current for lighting and power for workshop machinery, capstans, winches, and pumps. An interesting feature is the

supply of petrol to seaplanes from a large storage tank on the deck by means of the Bywater hydraulic system.

Captain Roald Amundsen's Ship, The *Maud*, is in the ice off Point Hope, north of Kotzebue Sound, and the eastern entrance to Daring Strait, according to a radio message received here recently from the Coast Guard cutter *Bear*. It is believed here that the *Maud* is returning to Nome because of unfavorable ice conditions.

The message also gives definite information that Captain Amundsen, who left the *Maud* some time ago with Lieutenant Oscaromdal, aviator, and a motion picture photographer, will spend the Winter at Wainwright, near Point Barrow, apparently having given up his proposed trans-polar airplane flight for this season at least.

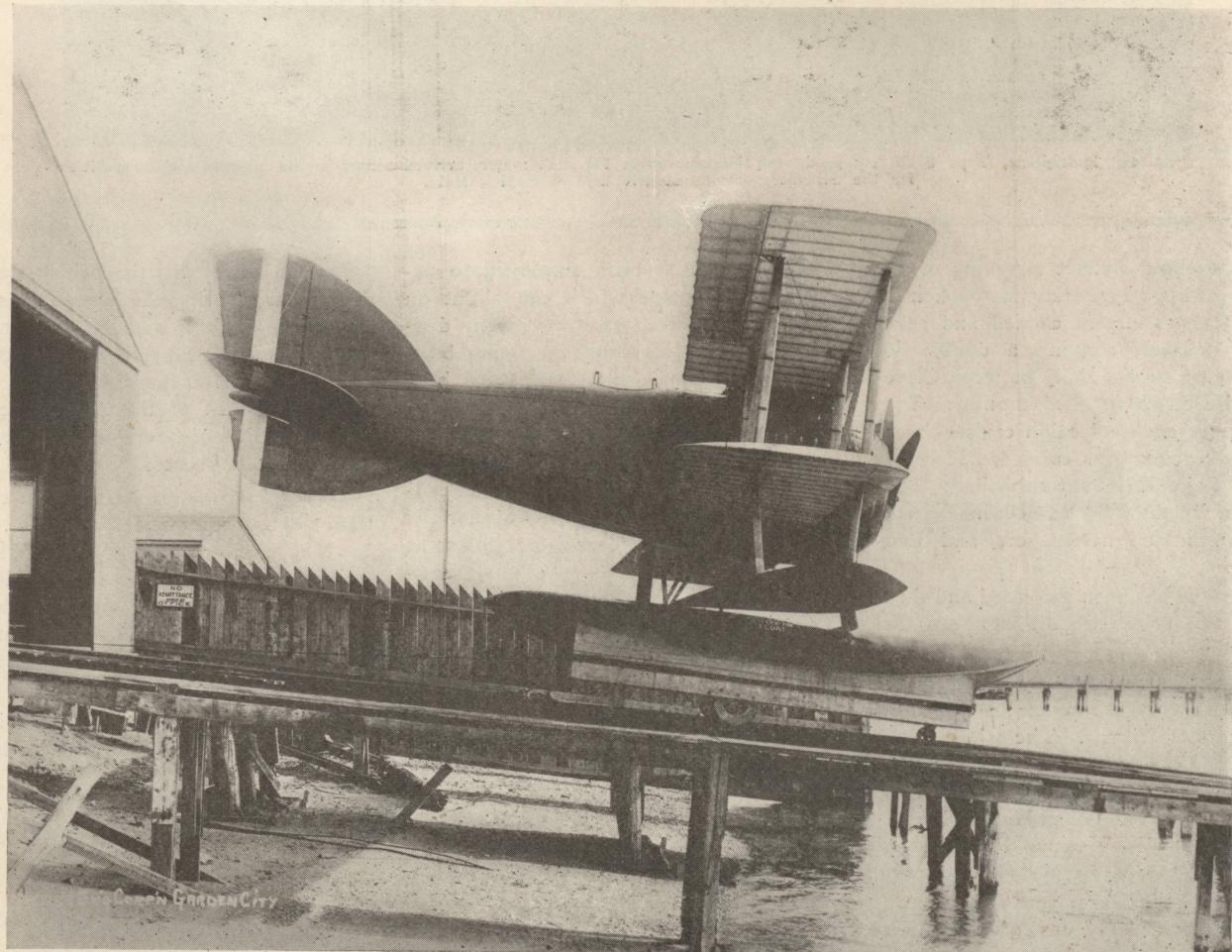
Augmenting the long list of congratulatory messages that the crew of the Sam-pao Correia, piloted by Lieutenant Walter Hinton, have received from distinguished men throughout the country were two from James S. Stephens, founder of the Air Board of Chicago and the

Aero Club of Illinois, and John Barrett, former Director General of the Pan-American Union.

Referring to the flight as the beginning of a great new era for the two Americas, Mr. Barrett pointed out that it would also exert far-reaching influence in promoting long distance travel and interior discovery over the comparatively unknown sections of Central and Northern Brazil.

He said: "I prophesized many years ago to President Pessoa of Brazil that 'by the time you hold your centennial celebration at Rio Janeiro in 1922 some fearless Americans or Brazilians will make the trip by air.' They laughed at me then."

The Air Ministry has recently approved the establishment of a service between Southampton and Cherbourg and Le Havre, with a subsequent service between England and the Channel Islands. The London and South Western Railway Co. is actively interested in the undertaking. The service is to be run by Supermarine flying boats, which have an excellent reputation for seaworthiness as well as good flying qualities.



Curtiss H. A. tractor biplane equipped with a Liberty special H. C. 420 H.P. Motor.

AIRSHIPS

In Building Its First Semi-Rigid Airship, America will have the aid of Umberto Nobile, distinguished Italian engineer and co-inventor of the semi-rigid type of lighter-than-air ships.

Engineer Nobile is managing director of the Italian government aircraft factory near Rome and comes to America for the building of the 300-foot semi-rigid airship for the U. S. Army now under way at the Goodyear Aeronautic Factory.

The semi-rigid type of ship originated in Italy.

Engineer Nobile has just completed the designs for a new semi-rigid ship for the Italian government, only slightly smaller than the one being built for the American Army.

The projected American ship, also called a "mother" airship, since it can be used as an airplane carrier, will be as long as a city block, and its great gas bag will have a capacity of 750,000 cubic feet. An idea of its size can be had from the fact that the largest non-rigid ships built in this country have a capacity of 180,000 cubic feet of gas, though some 203,000 cubic feet helium ships will be built next year.

It will have a speed of 70 miles per hour and a cruising radius of more than 4,000 miles and will be able to pick up and release airplanes while flying at full speed.

It will be the largest semi-rigid ship in the world when it is completed, the only larger American airship being the rigid ship ZR-1 now being built by the U. S. Navy at Lakehurst, N. J., and at Akron. The rigid ship will be 630 feet long and have a series of gas compartments or ballonets, with a total gas capacity of about two and a quarter million feet.

As between the fully rigid type, like the ZR2, and those semi-rigid ships, of which the Roma was one, whose only rigid framework consists of a triangular keel running along the lower side of the bag, the question of superiority is by no means settled and is enshrouded in extreme technicality. The layman, however, naturally feels most confidence in the ship which is a single rigid frame throughout and which does not depend at all on gas pressure to hold its proper shape.

Among the numerous distinct economic advantages of air transport, whether by air ships or by airplanes, there is one which is

often overlooked but which nevertheless ranks for some purposes among the most important. It has been the experience in the past that nearly every gain in speed has required an increase in the size of the transportation unit giving it. The fastest marine transport is by the largest liners, the fastest land transport by heavily-loaded limited trains. With aircraft; however, the reverse is the case, and the highest speeds are obtained with small units. The result is that it is necessary to run a great number of such units to handle any considerable traffic, and they can therefore be spaced efficiently through the day. To handle the passengers carried by a single limited train such as those running between Boston and New York, for example, about 40 airplanes of ordinary commercial size would be necessary, and those 40 machines could be distributed over 6½ hours at 10-minute intervals. Not only does the airplane cut the time in transit in half, it also insures that the business man will find a conveyance leaving for his destination within a few minutes of any time that he may wish.

Two lines of long distance airship travel, one from England to India and Australia and another from Spain to the Argentine Republic, may be looked upon as certain of establishment within a few years, writes the London correspondent of the *Christian Science Monitor*.

Both enterprises are fairly well along in the process of organization, say the promoters in London and Sir Keith Smith, well known aviation expert, in Australia and confirmed to some extent by the report of the Civil Aviation Board of the Air Ministry of Great Britain, which, dealing simply with the question of imperial air mail routes, recognizes the proposition that "imperial service would best be carried out by private enterprise supported by the State (State subsidy)."

The first mentioned line undoubtedly will be very much in accord with the proposals submitted by Commander C. Denie Burney, of Vickers, Ltd., to the British Government, and now under consideration by the Civil Aviation Board of the Air Ministry and also by the Indian and Australian Governments. The other project, which has just been announced, is promoted by a German-Argentinian combine, backed to some extent by the Spanish Government, which expects to inaugurate regular passenger service from Seville, in Spain, to Buenos Aires, South America, next year.

While many details in the two plans vary, both will use large lighter-than-air machines or ships of the Zeppelin or "rigid" type, and both are confident of making sweeping reductions in running times and fares for the long distances.

The airship's advantages of carrying capacity and range of action, says Commander Burney, have been overlooked because the lighter-than-air machine was found to be vulnerable during the war. But the defects in these "war-designed vessels," he says, largely have been remedied by improvements. He says recent developments have revolutionized the commercial possibilities of airships. They can be built to-day, "without introducing any experimental or untried features," capable of carrying thirty-eight tons of cargo, passengers or armament or all three, at a speed of more than sixty miles an hour, and a maximum distance without stopping of 3,000 miles, which would give a sure radius of 1,500 miles in ordinary weather conditions. Accordingly, a tentative time table has been prepared as follows:

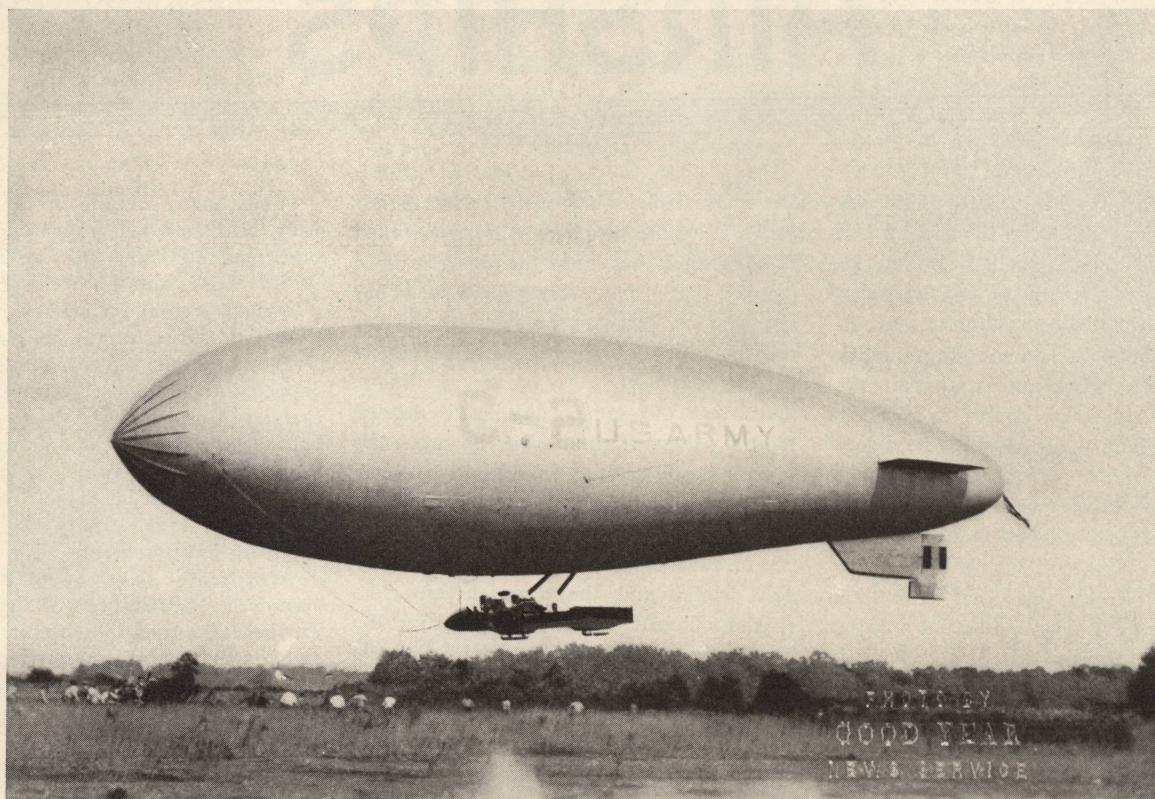
London to—	Now
Bombay	5½ days 17 days
Rangoon	7½ 21
Singapore	8½ 4-5 wks.
Hong Kong	8½ 4-5
Batavia	9½ 4-5
Perth (Australia)	11½ 4-5

A special Committee of Prominent Engineers and structural experts will make a complete study of the plans and designs for the big naval rigid airship ZR-1. The committee was appointed by the National Advisory Committee for Aeronautics, at the request of Rear Admiral William A. Moffett, Chief of the Bureau of Naval Aeronautics, in order that the navy may have the benefit of recommendations by outside technical experts in time to make any changes which may be considered advisable before work on the ZR-1 has progressed to an advanced stage.

As the result of a 300-hour test of a new airship engine, experts of the Naval Bureau of Aeronautics said that they were able to announce that it had established a world's record for fuel economy which had never been equaled by any other engine.

The engine was designed for use in the fleet airship ZR-1, now under construction at the Naval Air Station at Lakehurst, N. J. It was built by the Packard Company of Detroit on specifications furnished by the Bureau of Aeronautics.

Twelve engines will be provided for the ZR-1—six to be installed and six others to be kept as spares.



C-2 Army blimp which made a flight from Langley Field, Virginia, to San Francisco, California

The Army Dirigible C-2 which left Langley field on the first transcontinental flight of its kind ever attempted has once more proved the usefulness of this means of transportation.

The C-2—or “Pony Blimp,” as it is known—carries six men, including Major H. A. Strauss, who is in command. The destination of the flier is Ross Field, Arcadia, Cal. Major Strauss is making the trip for the purposes of scientific observation.

Completing the longest leg of its transcontinental flight and successfully combating the roughest weather encountered since leaving Langley Field on Sept. 14, the United States army dirigible C-2 landed at Brooks Field here at 1:45 o'clock this afternoon, having covered 850 miles from St. Louis in sixteen hours and twenty minutes.

Yuma, Ariz., Sept. 23.—Army dirigible C-2 left Yuma at 2 o'clock this afternoon for Ross Field, Cal., after receiving supplies of fuel and gas here. Major H. A. Strauss, commanding officer, said he hoped to reach the Pacific Coast objective, 250 miles distant, before dark tonight.

Radio aided the Army Airship C-2 on the westward leg of her trans-continental trip. During the cruise, hundreds of miles of which were traversed in darkness, radio was always available to lend a guiding hand when any doubt as to the position of the airship existed on this, the first transcontinental airship cruise.

The C-2 arrived at San Francisco, Thursday noon, September 27th.

Writing about the future of airships, Prof. Edward P. Warren of the Massachusetts Institute of Technology states:

In twenty years of operation the Zeppelin Company have had no structural collapses of their airships, nor have any of their commercial ships ever lost a passenger. The British record was equally clear up to the time of the loss of the ZR2 and such accidents had been equally rare in Italy, the home of the Roma type. Accidents in flight have been exceedingly rare, almost non-existent.

Obviously the airship is particularly well fitted for trips of great length and of such a nature that few intermediate stops are possible or desirable. It is especially valuable where exceedingly high average speeds are not required, 50 or 60 miles an hour being sufficient. The most notable example of such routes are those connecting America with Europe and America with Asia, North with South America, and England with South Africa and with Australia.

Even if run at the much reduced speed of 50 miles an hour for economy's sake an airship is capable of cutting two-thirds from the fastest possible time with any of the transportation means now used, over any of the routes mentioned. As an illustration of the possibilities, a ship of the size of the general type of the ZR2, but naturally strengthened structurally where the ZR2 proved too weak, would be able to travel from London to Australia, with stops in Egypt and India, in ten days or a little less. . . .

The Dirigible Manufacturing Industry in Italy is almost entirely in the hands of the Government, in fact, the Italian dirigibles are built by the Government at the Royal Aircraft Establishment in Rome, and only one firm in Milan, the Forlanini Company, has built dirigibles for the Government up to the present time. At present two tendencies are prevalent in aeronautical circles in Italy on the subject of dirigible construction, one is for the construction of a “Nobile” 20,000 cubic meter, semi-rigid type, which would represent the last word in semi-rigid construction, and the other is the construction of a large T type, 120,000 cubic meter dirigible designed by Usuelli. It is most likely, however, that of the two the 20,000 cubic meter will be built as this would allow the use of a large stock of material which was intended to be used for building a second T-34, which, however, was never built.

The re-erection of three large sheds in France is proceeding. These sheds are being erected, one near Paris, one near Marseilles and one in Algiers. These, together with the two existing bases at Maubeuge and Marseilles, will place France in a very strong position, when she can finance the construction of ships (which undoubtedly is her present intention), both from an international traffic point of view and for the operation of an airship service from Paris to her principal colony. Italy recently constructed a 1½-million cubic feet semi-rigid airship. They are now engaged in building a still larger

airship of this type, which will have a range of about 4,000 to 5,000 miles. Italy also has under consideration a commercial airship service from Rome to her North African colony, Tripoli.

The French Government Has a Project for the Establishment of a Line Marseilles-Algiers operated with dirigibles, the first one to be used being the German "Nordstern." The hangars at both ends of the line are now being built with German material. The dirigibles which will be used for this line will be between 30,000 and 50,000 cubic meters, and will be capable of transporting thirty passengers and between five and ten tons of mail and merchandise, making the trip from Paris to Algiers in sixteen hours instead of forty as it is at present. A branch line going to Tunis and another to Cairo and to Siria is also part of this project. The extention of the Marseilles-Algiers-Casablanca line to Dakar with two intermediate stops one at Agadir and one at Port Etienne, as well as an extension to Pernambuco in South America, is the final aim of the French Government, which, for this purpose, would require dirigibles of between 75,000 and 100,000 cubic meters. When this project is realized, it will take only two days to go from Paris to Senegal and only one week to go from Paris to Buenos Aires.

After a good deal of controversy, owing to the fact that he alighted from his balloon, which then ascended again, the Belgian aeronaut Demuyter has been declared the winner of the Gordon-Bennett Balloon

Race, which started from Geneva on August 6. It was at first thought that Demuyter had been disqualified through his balloon escaping, but the instruments and log-book of the balloon have now been examined, and the distance covered, reckoned to the point of alighting, has been accepted. This is approximately 870 miles from Geneva. Second was the American Honeywell, and third the French Bienaime.

A protest will be made against awarding first prize to Lieutenant Ernest de Muyter in the international balloon race, which started from Geneva Aug. 6, Captain H. E. Honeywell, who received second prize, announced today. Captain Honeywell returned home last month.

Cortlandt Field Bishop, of New York, Captain Honeywell said, is in Geneva as the representative of the Aero Club of America. He is not satisfied with the award and is prepared, if necessary, to appeal to the International Federation of Aero Clubs, Captain Honeywell added.

Captain Honeywell said he did not believe he received a fair deal, but thought protest would be futile, because an American verdict would make the trophy the permanent property of the United States, Americans having won it on four previous occasions.

Honeywell traveled 659.28 miles in 26 hours and 30 minutes and won the prize for duration of flight. His course took him through a squall, he said, and a succession of heavy storms. Lieutenant de Muyter was credited with having trav-

eled 852.53 miles in 25 hours and 40 minutes.

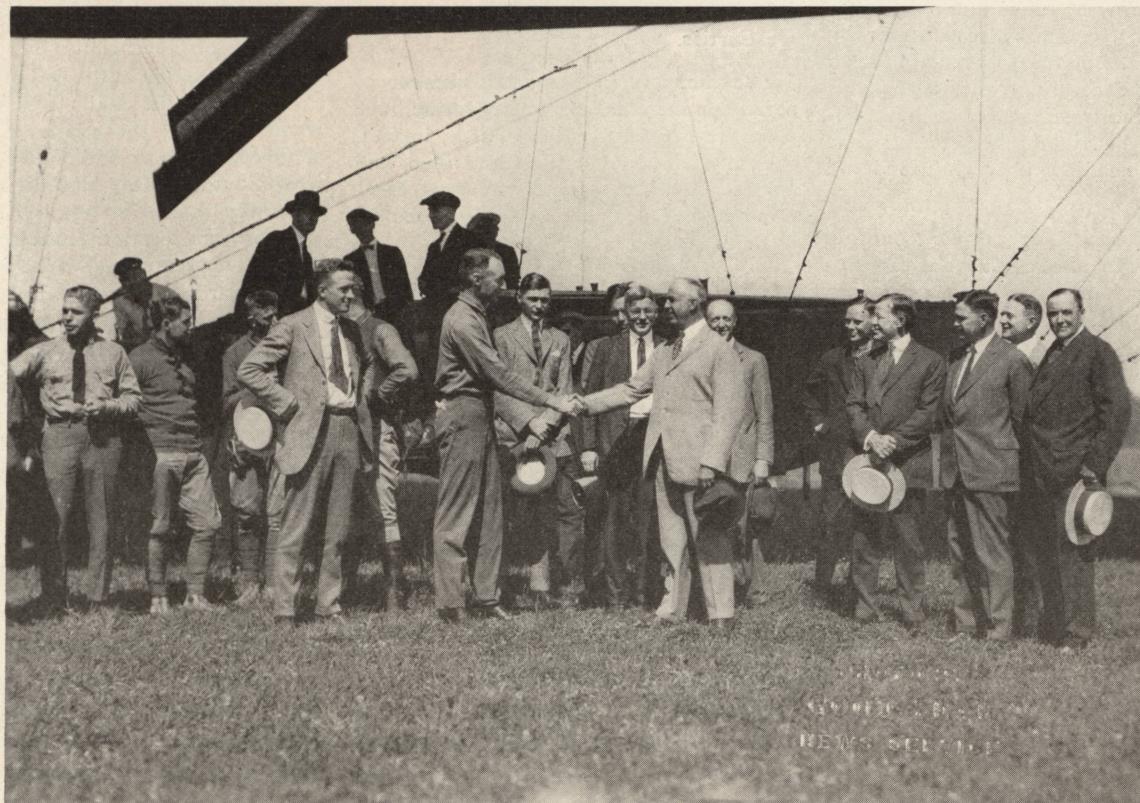
"Lieutenant de Muyter," said Captain Honeywell, "flew a greater distance than I did, according to his log, but he failed to make a proper landing. He reported that his bag escaped from him 24 hours after he had landed, but he did not make his report until a week after he had completed the flight. The rules of the contest require a complete log within 48 hours after landing.

"There are several points which, to my mind, have not been definitely established, the two most important ones being the exact distance traveled by Lieutenant de Muyter and the length of time that expired between his landing and the escape of his balloon. It has been stated that if Lieutenant de Muyter were disqualified no winner would be declared."

The biggest price reduction on record has just been put into effect by the Government's helium plant. The cost has been cut from \$2,000 to 9 cents a cubic foot!

An immense warehouse at the plant has stored in it 2,000,000 cubic feet of helium. A few weeks ago two carloads of the product were shipped East for army use. When the plant starts up in the fall it is expected that 150 men will be employed there, and work will continue day and night.

This is the only helium plant in the world. Experiment has shown that only the Texas gas contains helium. Gas from other States and other countries, when tested, did not contain the element.



Major H. A. Strauss, commander of the C-2 army blimp greeted by P. W. Litchfield, vice-president and factory manager of the Goodyear Tire & Rubber Co., of Akron, Ohio, builders of the huge blimp, on arrival at Wingfoot Lake Air Station, after completing the first leg of the cross-country flight.

THE WORLD IN GENERAL

AFRICA

A project is on foot to establish a commercial aviation company in Bulawayo with the idea of developing aerial transport in various directions. Definite steps have been taken in the direction of securing an aeroplane at once, in order to begin flying in show week, says the "Bulawayo Chronicle." Many residents are ready to help the project by assisting in the provision of capital, and there are a number of ex-officers of the Air Force in town and in the district who are keenly interested in the movement. Major Miller, South Africa's best known flying man, and an airman of wide experience, is to take a leading part in the enterprise, and that in itself ought to ensure success.

An aerial service between Pretoria and Cap is going to be inaugurated in the near future by the Government of the South African Dominion. If the results obtained from the establishment of the first line are as satisfactory as it is anticipated, this service will be considerably developed in the future.

In a report submitted by the Commander of the French Division at Meknes, Maroc, to the French War Department, it is stated that in a good many cases, during severe storms when it was impossible to communicate with troops stationed some distance apart, either by wireless or by ordinary means of transportation, due to the bad state of the roads, aeroplanes have been wholly successful in maintaining contact, distributing mail, and sometimes, when needed, in carrying food and ammunitions.

A regular aeroplane service connects Toulouse (France) with Casablanca (Morocco) with four weekly departures in either direction. The distance is covered in about 14 hours of actual flight, with an overnight stop at Malaga (Spain) on the southward trip, and at Alicante (Spain) on the return trip to France.

A pilot of the Latécoère Company has made a flight from Casablanca to Alicante, passing over Rabat and Malaga. In the afternoon of the same day he flew from Alicante to Tanger, a total of 1,600 kilometers in twelve hours.

ARGENTINE

In order to develop the aviation branch of the Argentine army and to provide at the same time an improved air service from the capital to the smaller commercial centers, the director of the aeronautic service has suggested the establishment of an aerial mail system by co-operation between the ministry of war and the di-

rection general of post offices and telegraphs, the department of commerce is advised by Vice Consul Houlahan, Buenos Aires.

The plan meets with the approval of the ministry of war and the postal administration. The suggested route from Buenos Aires includes the cities of Azul, Bahia Blanca, Patagones, San Antonio, Oeste, Rawson, Comodoro Rivadavia, Rio Gallegos, and Ushuaia.

An aerial convention regulating the flight between the Argentine Republic and the Republic of Uruguay has been recently arranged by the representatives of the two governments.

In Argentine civil aviation is eliciting a good deal of interest, and good work is being done by the Centro de Aviacion Civil, a civilian organization established for the purpose of encouraging the use of aircraft as commercial carriers. This organization has also been very successful in organizing a school for civilian pilots which is doing good work.

The Aeronautical Federation of the Argentine Republic has eleven hundred members and five associate aeronautical clubs. This organization is now promoting the building of 125 aerodromes all over the country. The Federation also owns 127 aircraft, of which twenty-nine are Curtiss.

The pioneers in the establishment of aerial commercial lines in Argentine have been the French and the British; in fact, the first line between Montevideo and Buenos Aires, a distance of about three hundred kilometers, was inaugurated by a British concern.

The Argentine Government has a project for the establishment of seven aerial routes, the first one of which has already been started. This line will operate between Baio-Blanca-Rio Gazeos, a distance of 3,800 kilometers. After the necessary aerodromes and other ground service are completed, the operation of this line will be given under contract by the Argentine Government to some private enterprise.

AUSTRIA

A number of scientists interested in hydro and aeromechanics had a meeting in September of this year.

The research work of the last years has brought about in all countries considerable progress in the development of the classical theories as well as the fundamental problems of practical hydraulics and aeromechanics. On account of the political events the interchange of ideas and the

personal intercourse among scientists have been impaired. By the said meeting it was intended to avoid, whatever hinders at the time the success of official international congresses, by simply rallying without any formalities the scientists interested in these special problems.

This meeting which was held at Innsbruck (Tyrol) between Sept. 10 and 13 is the outcome of previous efforts made by William Knight, while he was acting as Technical Assistant in Europe to the National Advisory Committee for Aeronautics, in order to bring about a closer international co-operation between scientists and technical men in every country in the interest of aeronautics and sciences thereto allied.

The meeting was called by Prof. Prandtl of the University of Gottingen, Prof. Karman of the University of Archen and Prof. Levi-Civita of Alto Adige, Italy, who have been prominent with Mr. Knight in the preparation of the ground for an International Congress of representatives of aerodynamical laboratories.

AUSTRALIA

Major Thomas Macleod, a Commissioner of the World's Board of Aeronautical Commissioners for Australia, writes: The first aerial mail service in the State of Queensland, it is hoped, will begin to function at the end of this month.

Another aerial mail service is to run from Brisbane, the capital of the State of Queensland, to Sydney, the capital of New South Wales, and thence to Adelaide, the capital of South Australia, via the Riverina district. This service, however, is not expected to be in operation until towards the end of the year.

Apart from the operations of "Quantas," there is no commercial aviation being carried out in Queensland, but we are hoping that the success of Quantas will encourage others to begin operations.

Major Macleod is a Barrister-at-law of the Supreme Court of Queensland and of the High Court of Australia. Author of a number of important publications, he was the pioneer of flying in Queensland, being the first man to get off the ground in a heavier than air machine in Queensland. He did the first experimental work carried on in that State with gliders, both monoplane and biplane types, some years before the Great War. On the outbreak of the war, he formed a small contingent of volunteers and built the first aeroplane ever constructed in Queensland, in order to instruct these

volunteers in the construction and working of aeroplanes, and by arrangement with the War Office, London, through the Colonial Office, he arranged to take to England for service with the Royal Flying Corps, eight of his volunteers, ^{all} of whom were accepted and did excellent service during the war. During the long sea journey to England, he gave them daily instruction in Morse sending, and, on arrival in London, all were able to pass at once the R. F. C. Morse sending tests.

Major Macleod served with the R. F. C. and R. A. F. for over three years, and, joining as a second lieutenant, went to France as a pilot just before the Somme push began and continued to serve there as an artillery and bombing pilot through the Somme battles and until after the Battle of Arras and Vimy Ridge in April, 1917. He was awarded the Croix de Guerre with palm for the results obtained by directing the artillery by wireless from the air during the Battle of Arras and Vimy Ridge. He was then invalided to England, and, although unfit for further flying, he was appointed (after eight months in hospital) Commandant of No. 2 Wireless School, R. F. C. He had attained the rank of flight commander in France, and went to France again as an aircraft park commander with the rank of Major in 1918. Shortly before the Armistice he was brought back to England to take charge of a proposed mobilizing station for the Royal air force, but this was not gone on with on the signing of the Armistice. Whilst awaiting posting to this station, he reorganized the training depot station at Hounslow, and was then sent to Northolt to reorganize the training depot station there, the latter being the station at which he had started his own training. He was awarded the O. B. E., military division. He was demobilized in March, 1919, and retains the rank of Major. After demobilization he was laid up in England (as a result of his war service), for three months, and then returned to Queensland where he resumed his practice at the Bar. He was the President of the Aerial League of Australia, Queensland Section, at its inception some years before the war, and is at present on the Committee of the Queensland Section of the Australian Aero Club.

BELGIUM

The first international air reliability trial ever held has just been completed at Brussels, and was won by a Handley-Page machine fitted with two Rolls-Royce engines. It was an open competition, but the Handley-Page was the only British competitor. Eight foreign machines, including a Farman Goliath, a Spad and a

Breguet participated. The course was over two circuits near Brussels, each circuit being 25 miles. The pilot had to state exactly how long he would take over each circuit, and marks were taken off for the amount of time by which he increased or was short of his declared time. Marks were also given for speed and climb and weight carrying.

The Handley-Page pilot estimated the time exactly for the first circuit, and was 12 1-5 seconds too quick in the second one. The machine scored 100 per cent marks for the take off, speed, climb, and weight-carrying. The first prize was £200, and there were numerous other awards and cups given by various aero clubs.

A new aeronautical organization, the Societe Ansuyne Belge de Constructions Aeronautiques (S. A. B. C. A.) has been created by the SNETA. This organiza-

tion is going to be the nucleus of the aircraft manufacturing industry in Belgium and its creation has been made possible on account of the guaranty given by the Belgian Government to the SNETA that at least 6,000,000 francs worth of contracts for military aircraft shall be placed with them every year up to 1926.

BELGIAN CONGO

The air line between Stanley Pool (Kinshasa) and Stanleyville, a distance of about 1,080 miles, is now in operation. The route is divided up into three stages, each of about 350 miles in length, each with an intermediate depot and stopping place. The first stage, from Kinshasa to N'Gombe, was open to passengers in July, 1920, the second, from N'Gombe to Lisala, in December, 1920, and the third stage, Lisala to Stanleyville, in June, 1921.



Major Thomas Macleod, a Commissioner of the World's Board of Aeronautical Commissioners, Inc., for Australia.

Traffic, particularly in mails, has been steadily increasing since the opening of the service. The river from Kinshasa to Stanleyville is navigable by river steamers, which take 15 to 17 days for the upstream journey, and 12 days for the return. Flying each of these stages in one day, the air service takes three days.

BRAZIL

Miss Marzo is the first Brazilian aviator who has obtained a pilot's license from the Brazilian Aero Club.

In the State of San Paolo a small aerial operating company has been organized under the name of Aviatic Nacional.

A biplane with two motors, entirely of Brazilian design, has been constructed by the firm of Lage Bros. The design of this aircraft is due to Captain Lafay and Captain Braconnot. This machine, which is called "Independencia," can take in either two 80 hp. Le Rhome motors or two Clerget 130 hp. motors, and can fly at a speed of between 120 and 140 kilometers per hour.

Two Brazilian aviators, Iavo Genil, a civilian, and Lieut. Filets Santos, of the Brazilian Navy, have made plans for duplicating the flight recently made by the two Portuguese aviators by flying the op-way from Brazil to Portugal.

CANADA

The Air Board of Canada reports that the total number of certificates and flying licenses issued up to August 31st, 1922, is 473.

CHINA

A flying school founded by rich Chinese a few months ago is now training young Chinamen for leaders in commercial flying in China.

W. H. Brown, a Canadian, who was an aviator in the World War, is in charge of the school. The Chinese boys make good pilots. Once they have learned a thing, they know it for good.

The machine used for instruction purposes is a Curtiss N. N. 4 army type, with an 800 horsepower Curtiss motor and capable of making sixty or seventy miles an hour.

Most of the students are the sons of rich merchants and have been educated in Canadian schools.

The Chinese Government has a rather important air service, and a very good aerodrome is to be found in the outskirts of Pekin. Among the aircraft used are Sopwith, Vickers, Handley-Page, Caudron, and others. During the summer season, and more exactly from May to

October, the Government has found an excellent means of training pilots. A number of aerial routes are operated during this period of the year by military pilots for the transportation of passengers, mostly tourists and wealthy Chinese. This new mode of transportation has proven to be very popular, especially among the educated class of Chinese.

DENMARK

The Government of Denmark has granted a subsidy of 110,000 crowns to the aerial company operating the line Hamburg-Copenhagen.

A congress of representatives of aeronautical interests of Scandinavian and other nations both former allied and former enemy was held recently at Copenhagen for the purpose of agreeing on a uniform aerial regulation as affecting international aerial navigation.

FINLAND

Twenty millions of francs worth of aircraft and equipment have been bought in France by the government of Finland.

Most of the flying machines used in Finland are hydroplanes. Hydroplane bases have been established at Sandhamm, at Helsingfors and Abo.

FRANCE

The Gliders' Competition, recently held at Clermont-Ferrand, has given the following results:

The first prize for maximum duration of a single flight has been attributed to a Farman monoplane glider, piloted by Bossoutrot, 5 minutes 18 seconds in the air, prize 5,000 francs.

The second prize, 3,000 francs, to Coupet, on a monoplane glider of his own design, time 4 min. 50 seconds.

First prize for maximum total duration of all flights made, 5,000 francs, Farman biplane, piloted by Bossoutrot, time 49 min. 55 sec.

Second prize of 3,000 francs, also to Bossoutrot, on a Farman monoplane, time 48 min. 55 sec.

First prize for maximum height attained (80 meters), to Bossoutrot, on Farman monoplane, 5,000 francs.

Second prize, 3,000 francs, to Coupet, on Coupet monoplane, 53 meters.

The long distance prize has not been attributed to any of the gliders entered to the competition, none of them having been able to land at a distance of at least 2,000 meters from the starting point.

Such authorities as Voisin and Bleriot say:

The best results obtained on gliders during the Clermont-Ferrand meeting consist in volplaning, for which a specially constructed machine is not necessary, the same thing being possible with any

properly constructed airplane. Had they really been flying, he says, it would be another matter altogether. The whole secret consists, he contends, in finding land which slopes at a sharper angle than a falling plane. One can then, he says, plane as long as the slope lasts, just like a raft floating down a stream or a vehicle rolling down a hill. As for flying by sail in the manner described by Professor Magnan, that remains an entirely undiscovered problem from a practical point of view.

Bleriot thinks the partisans of motorless flying are following the wrong road to success. They always talk of imitating a bird, he asserts, but their argument is basically wrong, because the bird has motor power.

The hypothesis Bleriot is willing to accept is that motorless flying will become a popular sport like tobogganing, and will be carried on under certain limited atmospheric and topographical conditions in favorable districts, such as Rhoen in Germany, which will become motorless flying sport centres, like certain parts of Switzerland are centres for Winter sports.

But from a practical standpoint he declares the flier must rely on ascending winds which must inevitably fail at certain moments. Some theorists believe it will be possible to make use of horizontal winds, but he asserts that a flying machine is not like a ship—supposing the wind fails the latter it still floats, whereas a failing wind must mean the plane will fall.

German achievements prove, it is held here, that the Germans possess unusually favorable flying ground where ascending winds are exceptionally constant. He says if one remains in the air one hour on a motorless glider there is no reason not to remain up twelve hours, provided one does not quit the privileged flying ground.

The regulations for the "Grand Prix 1923," for commercial airplanes, endowed by the French government and by the Aero Club of France, has been recently published. The following prizes will be awarded to the winners of the contest which will take place in September and October, 1923:

First prize, 500,000 francs.; second, 200,000 francs.; third, 100,000 francs.; fourth, 50,000 francs.; fifth, 40,000 francs.; sixth, 30,000 francs.; seventh, eighth, ninth and tenth, 20,000 francs. each.

The Michelin Coupe circuit has been divided into fifteen sections: Clermont-Ferrand-Lyon, 140 km.; Lyon-Himes, 230; Himes-Toulouse, 240; Toulouse-Pau, 150; Pau-Bordeaux, 170; Bordeaux-Auger, 300; Auger-Paris, 270; Paris-Saint Tgevert, 235; Saint Tgevert-Valenciennes, 130; Valenciennes - Mourmelon, 160; Mourmelon-Metz, 150; Metz-Strasbourg, 130; Strasbourg-Dijon, 250; Dijon-Bourges, 225; Bourges-Clermont-Ferrand, 170; a total of 2,950 km., or 65 km. less than the 1921 Italian circuit.

A new air giant has been flown at Villacoublay recently. Four 400 hp. motors and five tons of bombs on board of this new airplane, which can fly 7 hours at 150 miles per hour, make it a new powerful addition to the French air force.

Colonel Soconney has resigned his position as Director of the Service of Aerial Navigation, and from now on will be in charge of the Technical Inspection Service of military aeronautics.

Colonel Soconney has accomplished a magnificent work from the time when he took charge of the newly created service of Aerial Navigation.

The subsidies granted by the French Government to the aerial operating companies were 7,500 francs, as compared to 16,666 per year and per kilometer of the line operated. The apparent discrepancy is due to the fact that only 600 kilometers of aerial lines are operated in England, whereby 6,000 kilometers are operated in France.

A Farman Goliath, piloted by Lt. Tasche, with eleven passengers on board, left the Villacoublay aerodrome on August 7th. A few hours later it landed at the Bron aerodrome at Lyon. The next morning at eight o'clock the flight was resumed and after a stopover at Istres of a few minutes it proceeded to Toulon. The next morning again the flight was resumed and from Toulon the party on board of the Goliath went to Saint Raphael. Twenty-four hours later Colonel Bares, one of the passengers on board of the aeroplane, received a telegram calling him to Clermont-Ferrand where they landed at two o'clock. On the next morning the same party resumed the flight and went to Camp d'Avor, and on the next morning again the homeward trip to Villacoublay was made after flying 2,500 miles. The party on board of the Goliath included Col. Bares, Director of the Project Bureau of the Department of Aeronautics; Commander Berget, Captain Sire, Captain Dagneaux, Lt. Bares, of the French Navy, and others.

The Paris-Marseille line has been inaugurated recently by the French Company, Messageries Aériennes. The flight from one end to the other of the line is made in five hours and thirty minutes. Next year this line will be extended to Algiers, and two connections will be branched over from this main line going to Oran and Casablanca respectively.

The Aero Club of France has recently taken a very commendable initiative. A prize consisting of an artistic tablet has been granted to the patron of French aerial lines who has flown the largest number of miles during twelve months. The first prize of this sort awarded by the Aero Club of France has been granted to Mrs. Louise Faure-Favier. Mr. Laihacar has also received a similar tablet, and Colonel Casso, Mr. Pelabon and Mr.

Robichon have each received a bronze medal. The Aeronautical Commission of the Aero Club of France has also made provisions for the award of ten tablets, which shall be attributed to the aerial travelers of French nationality, who, from May 1st, 1922, to April 30, 1923, will have flown the largest number of miles.

A French military air squadron has achieved what is believed to be a record by carrying out a fine performance in flying in a formation of six machines from Paris to Mayence in 2 hours and 18 minutes. The distance being 550 kilometers (343 miles), this means that all six airplanes made an average speed of nearly 240 kilometers (150 miles) an hour.

The flight was made in preparation for the coming attempt of the military squadrons to do a non-stop flight from Paris to Mayence to Paris.

Scientific development of the age is summed up in an incident on the Paris-London Air Line.

Pilot Comte Henri de Perignon, after crossing the Channel in a driving storm, finding one of the two propellers damaged and the motor missing, wireless to the emergency station of Saint Inglevert, five kilometers from Calais, then descended with twelve passengers.

When the plane touched the earth a corps of experts was waiting. Within fifteen minutes the propeller was changed and the motor trouble eliminated.

Taking the air, the pilot landed at Le Bourget with his passengers only twelve minutes behind schedule.

Two efforts were made at Le Bourget to break world aviation records for duration and speed. Boussois, accompanied by d'Or in a Farman Goliath, set out to exceed the American endurance record of twenty-six hours. At daybreak Batelier, with Lieut. Bard, set out upon a flight from Paris to Casablanca, Tunis, Naples, and return, expecting to cover the 6,000 kilometers in sixty hours by flying for fourteen hour periods with seven hour halts for sleep and repairs. This was an unprecedented test for both man and motor power.

With the trip of a commercial passenger airplane from Geneva to Paris, wireless concerts for air passengers have become an assured fact. The experiment was wholly successful and satisfactory.

By a coincidence, ten of the fourteen passengers who enjoyed the concert were Americans. The music was sent out by the station at Lausanne and was heard plainly until the machine struck rain some distance beyond Dijon. From that point, however, conversation was held with Le Bourget.

Receivers were passed to each occupant, the pilot finally taking them and chanting to the passengers the songs received.

It has been reported in the French Aeronautical Press that the Technical Service of French Aeronautics has given a contract to a French aircraft manufacturer for a giant aeroplane having four motors, totaling 2,400 H.P., and having a carrying surface of 450 square meters (about 4,800 sq. ft.).

At the last meeting of the International Commission for Aerial Navigation (C.I.N.A.), held in Paris recently, the Aerial Convention of October 13, 1919, was ratified by France, Greece, Japan, Persia, Portugal, Czechoslovakia and Siam. The works of the Commission were inaugurated by Premier Poincaré and were presided over by Mr. Laurent Eynac, Under-Secretary of State for Aeronautics. At the meeting of the C.I.N.A. the questions of custom duties, wireless service and signals as affecting aerial relations between the ten nations which have ratified the October 13, 1919, Convention, were discussed, and agreements were reached whereby this group of nations is now in a rather favored situation as compared to other nations (like the United States), which have not as yet ratified the above mentioned aerial convention. The question of admitting Germany to the C.I.N.A. was discussed but no definite settlement was reached.

The Four Motored Breguet Leviathan, as soon as all of the test flights are completed, will make a trip from Paris to Dakar and Pernambuco, thus crossing the southern part of the Atlantic. The pilot on this trip will be Mr. Thierry.

Captain Fonk, ace of aces in the last war, has sailed from France to Rio de Janeiro on a mission involving aeronautical propaganda in the interest of the French aeronautical manufacturing industry. He is accompanied by the well-known flying pilot Fronval. Four airplanes accompanied the two pilots, two commercial types and two types of airplanes best adapted for acrobatic flying. These airplanes will be extensively used during the trip to South America for demonstrating the possibility of French aircraft from the commercial standpoint.

The French Aero Club has decided to call an Aeronautical Congress in Paris on the occasion of the next aeronautical exposition to which organizations affiliated with the Aero Club of France throughout the world will be invited to participate. Some of the questions which will be taken up in this Congress are:

1. The organization of commercial services in aeronautics.
2. The military aeronautical organization and the organization of an aerial reserve force.
3. The relations between commercial aerial operating companies and individual owners of aircraft.
4. The relation between the Aero Club of France and the Affiliated Aerial Organizations.

The Aerodynamic Laboratory at Goettingen is now one of the most important institutions of its kind in the world. Like other aerodynamical laboratories it has produced a very large quantity of statistical data of direct use to the designers of aircraft, but it has also given to the world an extraordinarily ingenious and in many respects a highly satisfactory and useful theory of the action of aerofoils which is certainly likely to accelerate the acquisition of aerodynamical knowledge in the future.

The invention of a wing-strain indicator by Klemperer, of Berlin, should prove of interest to the airplane industry. This instrument works on the theory of mass and weight pressure. When the plane is at equilibrium the indicator points to "1," and when the component forces are increased the indicator moves correspondingly, warning the pilot that there is too great a pressure on the wings. This device will be very useful when the pilot takes sharp curves, ascension curves, or when pulling up for a dive, and a great number of accidents should be prevented through its use.

During the Summer the Rumpler Co. has conducted an aerial service for tourists wishing to fly over the Alps. The enterprise was very successful and this service is going to be largely extended next year.

An air guide book has been edited by the Loyd-Luftdienst of Berlin. Charts

of air lines and fares for passengers and merchandise on all European aerial lines are to be found in such a book. Also a series of aerial charts is now being edited by the Loyd-Luftdienst which are extremely accurate and useful to pilots.

A new aircraft manufacturing company has been established at Aachen, Germany, by Klemperer, known under the name "Aachener Fluggenbau," where airplanes of low power shall be made.

Two Junkers hydroplanes have flown from Dessau to Naples, Italy, a distance of 800 miles, with one intermediate stop at Ancona. These two machines were equipped with 400 hp. Liberty motors and could have made the flight without any intermediate stop. Both machines were of the Standard six-passenger Junkers type which is now used on the Moscow-Berlin line.

A new metallic airplane designed by Victor Entler, a German aeronautical engineer, has been recently tested. This aircraft is a biplane type. The two wings are of the cantelever type of the same general design as the wings of the Junkers airplanes. A 30 hp. motor provides for the motive power. This airplane can make a non-stop flight of ten hours at 105 kilometers per hour.

The decision taken at the last meeting of the International Commission for aerial navigation, which was recently held in

Paris, to the effect that the nations which have ratified the protocol of the 1919 International Aeronautical Convention, are free to make independent agreements with the nations which have not ratified that protocol, is particularly interesting for the German Government which from now on can negotiate separate aerial treaties with all other nations.

Darnier, the well known German aircraft designer of the Zeppelin firm is now building aircraft in Italy. A first series of 6 hydroplanes equipped with two 260 hp. Maybach motors is now being completed for Spain.

"The Tageblatt" has offered a prize of 100,000 marks for the longest distance flown cross-country in a motorless aircraft by a German pilot in a German-made machine. The offer is to remain open until September 1, 1923.

At present there are in Germany five important air transport companies and twelve mail air routes.

It is with great regret that one records the death of Freiherr Lothar Von Richthofen, brother of the more famous Captain Freiherr Manfred Von Richthofen and a prominent member of the famous "Richthofen Circus."

Lothar Von Richthofen was an extremely gallant fighting man and one of the best pilots of his time in the German Air Force.



Ex-Kaiser's brother, Prince Henry, and airplane inventor Fokker, witness trials in the motorless flights recently held in Germany.

The all-metal Breguet "Leviathan," the fuselage of which was exhibited at the last Paris Aero Show, has been flown. Piloted by M. Thierry, the machine first made a straight climb of 1,000 feet, and the pilot then made a complete circuit of the Villacoublay airdrome. No sharp turns were attempted, as the machine is a large one, and it was thought wiser to proceed slowly with the tests. The "Leviathan," on which the late Lieut. Henry Roget was to have attempted a flight from Dakar to Pernambuco, is fitted with one of the Breguet-Bugatti quadruple engines, in which two groups of double vertical engines drive a common tractor screw via automatic clutches.

The famous French aircraft firm **Bleriot Aeronautique** has been reorganized as a limited liability company, with a capital of 6,000,000 francs.

M. Louis Bleriot has been appointed President of the Board of Directors of the new organization, which otherwise preserves its name, offices, works and staff, etc.

The French budget for Civil Aviation in 1922 amounts to 147,210,970 frs., including 45,382,000 frs. for air transport subsidies, an increase of approximately 14,000,000 frs. on 1921. In consequence of this increased assistance, air transport companies are extending and amplifying their services. The statistics of French civil aviation in 1921 show that approximately 1,460,000 miles were flown and 10,305 passengers were carried, in the course of 6,513 flights.

The Toulouse-Casablanca Line which has been in operation since June, 1920, has made 522 trips, aggregating 602,332 miles, on which 1,082 passengers, 179,768 pounds of parcels and 28,855 pounds of mail were carried. The normal flying time from Toulouse to Casablanca, a distance of 1,155 miles, is thirteen hours. The scheduled transit time is thirty-two hours, allowing for an overnight stop at Alicante, although the flight is frequently made in one day.

Two new lines will soon be operating in the Bordeaux District, one from Bordeaux to Lisbon and the other from Bordeaux to Nantes. The latter will connect Bordeaux by air with Geneva, through the Geneva-Lyons-Nantes Line already in operation. The Bordeaux-Toulouse-Marseilles service is to be extended to Genoa and to Tunis, while the Toulouse-Casablanca Line will evidently be extended to Dakar, Senegal, where many Bordeaux commercial interests are established.

During the recent general strike in France military airplanes flew all day over the city of Paris and by wireless telephone reported to Police Headquarters when scenes likely to result in a disturbance were observed.

Arrangements have just been completed for an Eighth International Aeronautical Exposition, to be held in Paris, between Dec. 15, 1922, and Jan. 2, 1923, in the Grand Palais des Champs-Elysees.

The classification of exhibits provides for balloons, airplanes, hydroplanes, helicopters, gliders, motors, aerial navigation, metallurgy and construction materials with reference to aeronautical use, methods of manufacture, transportation and maintenance of aeronautical machines and apparatus, meteorology, aerial physiology, photography, cinematography, map making and bibliography.

The newspaper "Petit Parisien" announces that it is organizing a race for small airplanes, the weight of which must not exceed 200 kilograms (440 pounds) with ten-horse-power motors, to be flown over a course of 300 miles next May. The paper offers three prizes, of one hundred thousand, twenty thousand and five thousand francs respectively.

The White Star Line announces that arrangements have been perfected for passengers from New York on the *Majestic*, *Olympic* and *Homeric*, landing at Cherbourg, to complete their journey, when desired, from that point to Paris by airplane. Two types of planes are used, one making the journey in two and one-half hours, the other in two hours. The average time by train is seven hours.

The Under-secretary of State for French Aeronautics is reported to be in favor of reducing the number of aerial companies on the Paris-London route to only two,—one British and one French. This move is to be made for reasons of economy because in this way only one subsidy would be paid by either the French or the British Government to the company operating the line.

General Gouraud of the French Army has adopted the aircraft as a favorite means of transportation when making inspection trips. Accompanied by Commander Denain, chief of the air service on the General Staff of the French Army in the Orient, General Gouraud has made a number of inspection trips in the region of Euphrates and in the State of Damas. Aircraft are used in the Orient quite extensively for the transportation of mail and for the transportation of sick troops from far outposts to base hospitals.

GERMANY

During the last few weeks, the eyes of the world have been focussed upon the gliding competitions taking place simultaneously in France and Germany. The marvellous durations attained by the German pilots, Herr Martens and Herr Hentzen, have come as a revelation to most people.

A remarkable motorless airplane flight lasting for three hours and ten minutes marked the close of the formal program of the annual motorless flying competi-

tions. Herr Hentzen, student flier of the Hanover Technical School, made the flight, thereby beating the record he established on the previous day when he remained in the air for two hours and ten seconds.

Airman Botsch of Darmstadt took off below the Wasserkuppe Mountain, and despite squally gales landed on its summit. Herr Hackman, also of Darmstadt, landed 330 meters above his starting point. He remained in the air ninety minutes.

Hentzen's latest accomplishment was made in the same machine with which he had made his previous record flight of two hours. He flew in a westerly wind of from ten to twelve meters per second, accompanied by gusts sometimes as strong as sixteen meters. He landed 350 meters above the starting point.

For their feats of Friday and Saturday, Herr Hentzen and Johann Maertens, who flew for sixty-six minutes, have been awarded 70,000 and 50,000 marks respectively.

The Hanover students' record-breaking airboat, the Vampire, looks in the air like a huge, ungainly, angular, futuristic seagull. Examination of its structural details confirms the first impression that it is closely modeled on nature's soaring and skimming birds.

A fleet of huge gliders which can travel thousands of miles without landing, says the "Daily Chronicle's" aeronautical correspondent, is the dream and ambition of German scientists who are developing motorless aircraft.

These big sailing ships of the air will be cheap and light and their non-stop flights will be made possible by improvements in construction and universal charting of the air. To discover and study the air currents, an airship will be employed by the German experts as a flying laboratory.

The line between Königsberg and Moscow is on a strictly business basis.

In view of the peculiar position of the Russian-German line in this respect its operating record is of especial interest. It will be noted that the line has been spoken of as connecting Königsberg and Moscow, although it has frequently been referred to in the press as a Berlin-Moscow undertaking. It is true that the whole distance from Moscow to Berlin has been flown in a single day, but the regular practice is to fly from Königsberg in the morning after the arrival of the train which leaves Berlin the preceding evening, arriving in Moscow late in the afternoon. The whole distance between the two capitals, which takes nearly or quite five days by rail, is thus accomplished in less than 24 hours.

The great German steamship companies, the Hamburg-American and the North German Lloyd, are taking a keen interest and aiding in every way in the development of all sorts of commercial flying.

GREAT BRITAIN

Nine machines competed for the British Aerial Derby in the race over a circuit of 200 miles, and started at various intervals according to their handicaps, as follows:

No.	Machine
1. Bert Hinkler	Avro "Baby"
2. L. L. Carter	Bristol Monoplane
3. F. P. Raynham	Martinsyde F6
4. A. S. Butler	D. H. 37
5. L. R. Tait-Cox	Mars III
6. H. H. Perry	S. E. 5 A
7. R. H. Stocken	Martinsyde F4
8. A. deH. Haig	Bristol Bullet
9. J. H. James	Mars I "Bamel"
Engine	Flying Speed
35 Green	Time M.P.H.
100 Bristol Lucifer	2:35:4 76.6
200 Wolseley-Viper	1:50:04/5 107.8
275 Rolls Royce	1:48:12 109.6
200 B. R. 2	Failed to finish
200 Wolseley-Viper	"
300 Hispano-Suiza	"
400 Bristol Jupiter	1:21:57 145
450 Napier-Lion	1:48:2/5 177.8

The machine first to finish was the Bristol Monoplane, followed 22-1/5 seconds later by the Bristol Bullet and then 5-2/5 seconds later by the "Bamel". Mr. James' first lap (99 miles) took 32 minutes, and it is claimed that his time of 178 miles an hour is the world's record for 200 miles. At one period of the race when traveling down-wind, it is said that he flew at a speed of 246 m.p.h.

While the race was in progress a fine display of acrobatics was given by Flight Lieut. P. W. S. Bulman on a Mars VI, fitted with a Siddeley "Jaguar" engine. There were several other races while the main event was going on, and after same was completed, in SE5A machines.

The last event of the afternoon was the August Open Handicap of 16 miles, in which six machines participated, and the first prize of £30 was won by Flight Lieut. Longton in an SE5A.

At Croydon Field they talk vaguely, but with enthusiasm, of air lines to India and Australia, the latter to deliver British mail in seven days. They remind you that during the three years of commercial aviation more than 2,000,000 air miles have been flown between London and the Continent; and 7,000,000 miles will be flown throughout the world in 1922; that of the 14,000 passengers carried in that time, more than two-thirds had been transported during the last year, and that 250 tons of goods have been carried of a total value of more than \$10,000,000.

Recently Miss Gladys Cooper, the well-known actress, traveling by Handley Page, landed at the Croydon aerodrome from Paris after a lightning trip to the gay city, between rehearsals, in order to provide herself with new costumes.

The Air Navigation Order, 1922, recently issued by the British Air Service, is an amendment to the regulations issued in 1919,

differing mainly in certain details prescribed by the requirements of the International Air Navigation Convention.

There are other features of some importance included in the new regulations, of which the following are notable:

(1) From January 1st, 1923, all aircraft will be required to carry certificates of airworthiness, instead of only public transport machines.

The daily certificate, however, is required only of public transport machines.

(2) Every British aircraft shall when flying carry such instruments as are prescribed by the Secretary of State.

In addition the fees for the various certificates and licenses have been revised. The fee for original registration of an aircraft is £1 1s., for renewal of the certificates of registration 5s.

The fees for the issue of a certificate of airworthiness for a type aircraft are as follows: Nominal H.P. not over 200, £65, N.H.P. not over 400, £90, N.H.P. not over 600, £110, and N.H.P. over 600, £125.

These fees may be reduced for types which so resemble existing types as to reduce materially the work of testing and examination. For subsequent aircraft of a certificated type the fee is to be £5 5s.

The fee for each medical examination and flying test of a pilot is £1 1s., and the fee for each license and technical examination is 5s.

The Order makes provision for the exemption from its provisions of the Irish Free State if at any subsequent date the said State makes separate provision for the giving of effect to the international convention.

The estimates for 1922-23 include £364,000 for Civil Aviation, and in addition £86,500 for the Headquarters Staff, of which £51,000 is for the Meteorological Office Staff. £200,000 of the vote for Civil Aviation is to be applied to the direct assistance of "approved" British firms operating cross-Channel air services; £79,000 is allotted for Meteorological services (excluding Headquarters Staff); £38,000 for the upkeep of aerodromes; £15,000 for expenditure on air routes, surveys, wages of W. T. personnel, etc.; £8,000 for technical equipment; and £61,000 for works and buildings at Croydon, Lympne, Malta and the Kidbrooke wireless station; and the illumination of air routes at home and in Egypt.

Seventy per cent. of the passengers carried this summer on the three British air lines linking London and the Continent have been Americans. The two French lines and the Dutch line operating out of London also report a preponderance of American travellers. Finding London drab and a bit blasé, and wearying of the thrills Paris fabricates for its tourist visitors, the Americans satisfy their itch for adventure by air tripping.

During the last year more than 9,000 persons have made the trips between London and Paris, and London and Brussels by air.

There are three British lines flying out of London, the Handley-Page Air Service, the Instone Air line and the Daimler Airway, Ltd., controlled by the British Air Ministry; two French lines, the Grandes Express Aériennes and the Messageries Aériennes, and the Royal Dutch Air Service, the last connecting London with Amsterdam. All operate under large governmental subsidies.

The organizers of the three British air lines had little intention of bidding for the tourist traffic during the early days of the ventures; instead, they intended to furnish an easily accessible means of cutting from five to seven hours from the travelling time to Paris for the business man with affairs in both cities. They also intended to stimulate interest in aerial navigation, and this is the principal interest of the Government. The man with business in Paris may leave London in the morning, devote two or three hours to his errand in Paris and return to London in time for a late dinner.

The official returns show that the flight efficiency figures for the three British companies on the London-Paris route for June, flying having taken place on each day of the month, are as follows:

Handley Page Transport, Limited, 98.6 per cent.; Daimler Hire, Limited, 96.5 per cent.; The Instone Air Line, 96.0 per cent.

Between August, 1919, and March, 1922, the total value of imports by air amounted to £1,157,556, and of exports £605,759, a grand total of £1,763,315.

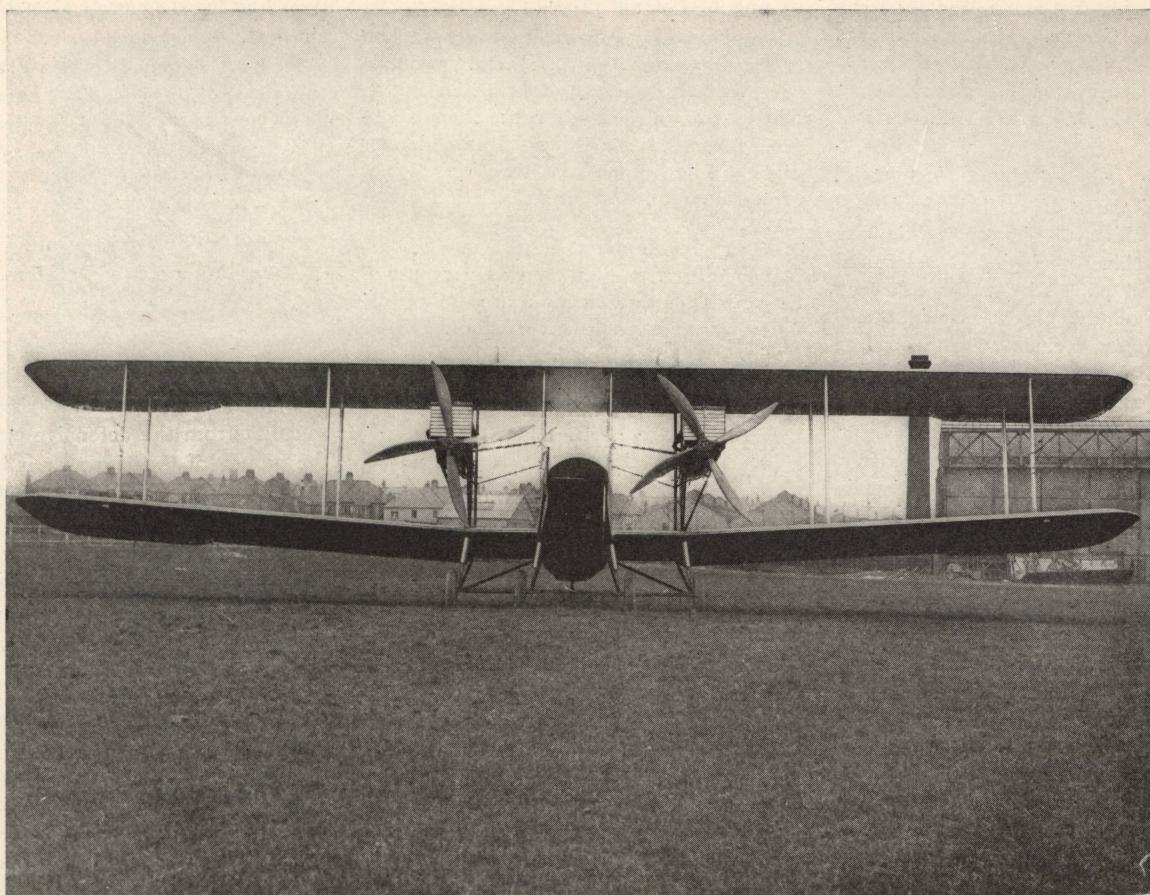
The London terminus is at Croydon Flying Field, and about a dozen passenger carrying machines leave there every day during the summer for Paris, Brussels or Amsterdam. Some of the larger liners carry twelve passengers, and the Handley-Page people are now experimenting with a plane to carry eighteen passengers and two pilots. All of the Handley-Page liners carry two pilots.

Leaving Croydon at 10 o'clock the tourist arrives at the aerodrome Le Bourget, just outside Paris, shortly after noon. A motor car whisks him to his hotel in the city. The original fare of 15 guineas has now been reduced to 6 (about \$28), which brings the trip within the reach of any first class passenger. One result has been the creation of a large group of air fans, some of whom make the trip as often as three or four times a month.

Commander Burney of the British Air Force has made an offer to the British Government to organize an airship line between India and Australia.

Commander Burney in his offer to the Government has been able to put his estimate of running costs under one-third, and his estimate of capital costs under one-half of the estimates which were put before the late Imperial Conference. This is chiefly due to certain recent technical inventions.

A wealthy financier who has to travel a good deal between London and continental capitals is having constructed in Eng-



Latest Handley Page airplane used on the London-Paris air line.

land a huge "office" airplane, complete with desks, typewriter, accommodations for books, etc., and equipped with a wireless telephone room.

Captain Guest, of the British Air Ministry, has made the announcement that a report presented by Commander Burney giving the details of a project for establishing an air mail service between London and its Indian Colonies has been examined and approved by the Air Ministry and has now been referred to the Civil Aviation Advisory Committee for further consideration.

The British Fairey Aircraft Manufacturing Company has recently completed a three seater scouting machine equipped with a Lyon Napier 450 H.P. motor. The two main characteristics of this new aircraft are a special landing gear equipped with an oil system shock absorber and wings of variable curvature.

Lieutenant Mac Swiney, of the Irish Army, has made the first flight between London and Dublin on an airplane which is the first of a series of military aircraft now being built for the Irish Government.

The London-Bruxelles aerial line is going to be extended to Cologne in order to establish a much needed connection with the German line Cologne-Berlin. When this extension is completed, passengers and merchandise can make the trip London-Berlin in seven hours.

A satisfactory running test of 54 hours and 44 minutes of the Lyon Napier type of

motor has been recently reported by the Air Ministry. Power adopted during the test—410 to 412 H.P.

"The Daily Chronicle's" aeronautical correspondent, writing on the race between nations in the development of aircraft, refers to the British winged aerial cruiser now being completed by the Fairey Aviation Company. It embodies many features which are official secrets. It will be constructed of metal, will develop not far short of 3,000 horse power, be capable of long overseas flights without alighting to refuel and will weigh fifteen tons.

Another secret British air leviathan is a great winged troop transport with a hull of steel tubing capable of carrying twenty-five soldiers with their full equipment long distances.

A leading British technical expert who has just returned from visiting Germany is responsible for the statement that German scientists are designing colossal multi-engined aircraft which loaded will weigh as much as 100 or even 150 tons.

Some time ago a proposal was made to the Handley-Page Company to operate a line of passenger cabin airplanes between Washington and New York. In London and Europe the imagination of both Government officers and flying experts has been intrigued by the possibilities of aerial passenger navigation. One French line has operated passenger liners to Rheims, Cologne, Prague and the Swiss cities, and several trips were made as far as Warsaw. It is

predicted that the linking of all the important European cities by air will be accomplished within ten years, judging by the advance in aerial science brought about since the war by the passenger lines.

There has been built for the Air Ministry a new type of machine shortly to be tested which it is believed will place an entirely new aspect on the aircraft versus battleship controversy.

Known as the Cubaroo, this new craft is a winged destroyer intended to be used, at least at the outset, for coastal defense purposes. It is fitted with a very high-powered engine. It will have a range, when fully loaded with bombs or torpedoes, of more than 1,000 miles.

The Cubaroo is a three-seater machine and will be a most effective weapon when operating in large numbers to repel not only invading seacraft but also aircraft. Against such a machine a Zeppelin would stand very little chance, for a feature of the new design is ability to climb at a tremendous rate.

The cruising speed of the craft will be about three miles a minute. Four machine guns will be fitted into the coastal defense plane. Great things are expected of it by the air authorities.

Mr. Amery, financial secretary to the Admiralty, answering questions about recent experimental attacks by airplanes on warships in the Channel, said the torpedo-carrying airplanes were sighted fifteen minutes before firing their torpedoes. They were under dummy gunfire.

Great interest was taken in the biggest air race ever organized in England for a cup given by King George. The total distance flown was 810 miles; the first stage 394 miles, from Croydon to Glasgow; the return route to Croydon via Manchester and Bristol.

Twenty-one competitors started from Croydon in airplanes of all shapes and sizes from a tiny thirty-five horsepower biplane to a huge machine developing four hundred horsepower, all piloted by well-known airmen. Some of the bigger machines also carried passengers, including women, one of them being Princess Lowenstein-Wertheim, who was a passenger in her own machine. The Princess is 68 years old.

Thirteen machines reached Glasgow safely, the fastest time being made by Captain Barnard, who covered the first stage at a speed of 120 miles an hour.

Hundreds of thousands of spectators witnessed the flight.

The D.H. 34's, both on the Daimler and Instone lines, are now being fitted with Reid turn-indicators, and the pilots are extremely pleased with the sensitiveness and efficiency of these instruments. In one test, made at dusk in misty weather, the pilot put his head down inside the cockpit so that it was impossible for him to see the ground and, using the indicating lights of the turn-indicator to guide him, kept the machine flying straight for mile after mile without the slightest difficulty.

The Air Ministry in a statement says that the British Navy is better equipped in regard to aircraft than that of any other power.

"We have about 98 fighting machines in commission; another 48 are in use for training purposes; and over 300 are in reserve, apart from machines requiring reconditioning.

"At any moment we can put 700 or 800 machines into the air, and we have an additional 3000 machines available."

A mysterious airplane, reported capable of covering four miles a minute, was the sensation of the around England air derby, flown on September 8, for which thirty crack British pilots were entered.

The plane, said to be something entirely new in the realm of flight, has been constructed in secret at Bristol. It was piloted by C. W. Uwins, famous English airman.

The derby for the "Kings' Prize," was over a course 900 miles long. It was a handicap affair, with entrants ranging from high speed monoplanes, such as the mystery plane is reported to be, to giant amphibians and cross-channel passenger buses.

Sea Lion II., which flew recently at Naples, winning the Schneider Cup for England, was one of the most favored entries. H. C. Baird piloted this speedy seaplane, which, like others, was fitted with special landing gears.

Admiral Mark Kerr was at the wheel of one of the air racers.

The Derby was flown in stages—a hop to Birmingham from the starting grounds here, halt of half an hour, then on to Newcastle and Edinburgh; then Glasgow, where the machines remained over night. The return trip was by way of Manchester and Bristol.

A big development in the use of airplanes in war is predicted as a result of the giant engines which are being ordered by the British Government. These engines, six of which have been ordered, are of 1,000 horsepower and capable of 1,800 revolutions a minute.

The statement is made that the new airplanes will have a range of 2,500 to 3,000 miles. The new engine was designed and built by the Messrs. Napier and was the outcome of several years' experiment and research. It has sixteen cylinders and has run satisfactorily for thirty consecutive hours on a bench. Its weight is about three pounds per horsepower.

A continental airship service could be inaugurated if the Air Ministry were prepared to guarantee the same subsidy and facilities as are now granted to aeroplanes running on the London-Paris route for a number of years, making due allowance for the increased distance to be flown.

As in the case of aeroplanes, the Air Ministry would assist in the provision of the fleet.

A syndicate with a capital of £80,000 will be formed, who will erect mooring-masts near London and Berlin, and provide the running expenses of two airships for one year.

The Air Ministry will arrange for the supply of one 31-ton Parseval airship and one 31-ton Zeppelin airship of the Bodensee type instead of the 75-ton Zeppelin due for reparations. It has been ascertained that the German firms are quite willing to build these ships. British engines can be fitted if desired.

These two airships would then be run by the syndicate on the London-Berlin route, to ascertain which type is the more suitable for this work, and the actual cost of running, profits, etc. After a year's experience a company would be formed to extend the service to Vienna and Rome, the necessary airships of the selected type being built in England.

The Air Ministry is to place Kinsnorth Airship Station at the disposal of the company for constructional and repair work at a rental equivalent to 5 per cent. on the capital value of the station. The company would undertake to man the airship with men who would be available for service in case of war, and to hold all its ships at the disposal of the Government for war purposes. In return, the company would have the exclusive right of carrying mails by air to the countries served by it.

A project of this line has been submitted to the Air Ministry.

Lieut. Commander Kenworthy emphasized the great need of strengthening the air fleet.

"We are exposed to two great dangers from the air," he said—"massed attacks by fleets of airplanes flying by night and scattering poison and disease germs on our cities, and having our food supplies cut off by attacks on the trade routes. The two capital ships would be of little use warding off such raiders."

George Lambert, a former Civil Lord of the Admiralty, expressed the opinion that the British Navy was inadequately equipped with aircraft. "Can the navy say that from the defensive point of view the money of the taxpayer is being spent to the best advantage?" he asked. "You are going to spend £16,000,000 on two new battleships, but it is useless to spend money on capital ships unless you have sufficient aircraft for the ships you already possess."

"The navy of the future must take to air; otherwise it will be at a hopeless disadvantage," said Capt. Viscount Curzon in the House of Commons when the naval estimates came up for discussion.

One of the favorite times for aerial trips is by lines that leave Croydon each day at 4 o'clock. That means starting from London at a comfortable interval after luncheon and reaching Paris in plenty of time for dinner.

Air services are now being extended to other parts of the Continent. Twice weekly an airplane flies from London to Paris, Lyons and Marseilles. It has been so far chiefly patronized by passengers for the *Peninsular and Oriental* liners for the East, but it is also possible to change at Lyons to another airplane for Geneva. Another goes every day to Paris, Strasbourg, Prague, Vienna and Budapest, and it is intended shortly to extend it to Belgrade, Bucharest and Constantinople. The most hopeful sign of all is the steady way in which the volume of travel across the Channel has been growing. French companies made numerous voyages between London and Paris last year, carrying 2,792 passengers.

Introductions of auxiliary squadrons in the British Air Service will mark the beginning of a territorial air force, and this will naturally be based on industrial centres in the enrollment of skilled workers in those places.

Meanwhile, experiments are proceeding with new types of aircraft. The Air Ministry has something like forty or fifty in different stages of testing. At present several types of steel machines are undergoing scrutiny.

British aviation establishments in the East have been strengthening in the last few months, and in India the whole situation is being carefully examined by a small investigating body.



General view of the airdrome of Amsterdam (Schiphol).

When the expansion of the British air service, now being considered, is completed and all units are in existence, the air force will in case of need be able to put 500 machines in the air for home defense; but this does not mean that there will be 500 new machines, or that orders will be placed for the building of that number. It does not necessarily follow that all the machines required by these squadrons will be new, but those that are will be of the latest types, for the different kinds of work that may have to be done.

Premier Lloyd George, replying in the House of Commons to Viscount Curzon, said that the Government as a result of the inquiry by the Committee of Imperial Defense had decided to adopt the scheme submitted by the Air Ministry to provide a force of 500 machines for home defense at an increased cost of £2,000,000 per annum. Of this sum £900,000 would be provided for by economics in the estimates of the Air Ministry.

The Daimler Airways Company, operating aerial expresses between London and Paris, have installed in their engine repair sheds at the Croydon Airdrome, London, an aero engine testing plant. By an ingenious combination of electrical and hydraulic apparatus, the slightest defect in an engine under test can be detected and located, and, in addition, the plant shows at a glance the exact power the engine is developing when running at various speeds.

American tourists are proving to be the salvation of cross-channel air transporta-

tion. They have been attracted by the new means of making the trip from London to Paris and are giving the aerial companies much needed support.

Thanks largely to them, the service this year has become as regular as train service, and every day, on an average, 100 passengers fly to Paris. They present themselves at one of the large hotels at a given hour, just as though they were going to catch a train, and are run out by automobile to the Croydon airdrome. There they board airplanes and in a little over two hours find themselves in Paris, with other automobiles ready to take them to their hotels.

A new air service with water planes, between Southampton and the French ports of Havre and Cherbourg, is being organized by the British Marine Air Navigation Co., largely for the convenience of trans-Atlantic passengers landing at French ports who desire to go to London. The cross-channel flight to Southampton will take about an hour and will connect with a fast train to London. Service will probably begin in October.

GREECE

It is stated that firms in Greece, interested in commercial air transport, are arranging for the organization and operation of an aerial line between Athens and Brindisi, calling at Corfu and Corinth. The service will be three times weekly at the beginning and later on a daily service will be run. This line is intended to be the first stage in a network of air routes which will radiate towards the Black Sea,

Asia Minor and Egypt, and thence onward to the Far East. This project is a private one, as the Greek government has engagements with other nations.

GUIANA, DUTCH

Adolph F. C. Curiel, Commissioner World's Board for Dutch Guiana writes under date Aug. 16, 1922, from Paramaribo Surinam, Dutch Guiana as follows:

"Since the development of the flying machine, only recently for the first time Surinam and population had the pleasure to see a flyer. A hydroplane owned by Industrials in French Guiana made its first visit to Surinam, arriving at Paramaribo—the capital city—at about 10 A. M., and descending after a very short tour over the city in the Surinam river. The crew of the hydroplane, consisting of an engineer, a pilot with Mr. Dutertre, commander of the French Air service in Cayenne, were personally welcomed by the Governor.

"I do not need to explain that this event will be a remarkable one in the history of Surinam. The street alongside the Surinam river was overcrowded and the whole population was full of thought of the hydroplane.

"A demonstration took place on the next day at about 4 P. M., and was attended by the whole population with great enthusiasm. The demonstration was a very short one, owing to the fact that the machine had but very limited stock of fuel.

"The next day the hydroplane started at about 9:30 A. M. for St. Laurent (about

120 miles from Paramaribo), where it arrived at 11 A. M. The trip St. Laurent to Surinam was made in about 1½ hours.

"Circulars were sent from the Department of Agriculture, Commerce and Industry to local leading business men with a view of finding out if in their opinion local business conditions were such as to warrant the establishment of a regular aerial service between Pernambuco and the interior.

"The writer had an interview with the Commander of the hydroplane and he understood that this visit was the opening of negotiations for a regular air mail service between Surinam and French Guiana and furthermore Paramaribo and interior. It is expected that within a few days, a new flight shall be made to Surinam on the occasion of "The Queen's birthday."

"The local press announces that the seaplane "Sampaia Correio" with the American aviator Bye, left New York yesterday morning for a trip through West India to Rio de Janeiro (Brazil), and that Surinam will also be visited during the trip. The writer shall be delighted to assist in any possible way in this connection."

HAITI

Mr. Eugene Roy, Commissioner of the World's Board of Aeronautical Commissioners for Haiti, writes:

"A demonstration of the work of the Fourth Air Squadron, U. S. Marine Corps, before a distinguished party of guests, was held at Bowen Field, Port-au-Prince, Republic Haiti, recently, and illustrated the important part that aviation has come to play in the work of policing the troubled parts of the Caribbean.

"The party in honor of whom the exhibition was given included the U. S. High Commissioner to Haiti, the President of Haiti, and his Cabinet, the Chief Justice, the Chief of the Gendarmerie D'Haiti, the Chief of the Engineers and Sanitary Service, and the Mayor of Port-au-Prince.

"The program included a formation flight of DH4B's, a demonstration of the use of the ambulance plane attached to the squadron, Radio communication with plane in the air, practice bombing and gunnery flights, parachute jumping, and an exhibition of stunting and a 'dog fight' between two JN planes.

"The exhibition was staged in the presence of an audience of two thousand persons.

"The unsung praises of the Marine Aviation units in Haiti and San Domingo does not affect the fact that this important branch of the service has done and is doing an important work in the far flung reaches of the tropical jungle toward the establishment of peace and good order.

"The airplane patrol established over the island republics has been the means

of seeking out and checking incipient revolutionary movements in numberless instances in a manner that would have been well nigh impossible through the use of scouting units of infantry. As a means of communication between widely separated posts throughout the island, the aviation units have proved invaluable. And in addition to the military uses of the airplane, the ambulance service established by air through the use of a specially equipped ambulance plane has brought to the service of outlying posts the last word in speedy medical assistance, and has been the means of saving lives not only of members of the expeditionary forces, but of any and all who might have need of medical assistance."

HOLLAND

Anthony Fokker, the Dutch aviator and airplane inventor, has announced he will award a prize of 1,000 Dutch guilders for the 1923 tournament. There also will be a prize of 250,000 marks for a competition in which the flights will be purely motorless sailing, without hillside winds being used. Fokker himself made the first flight of the glider competition with a passenger, but merely executed an exhibition and did not participate in the tournament.

Fokker does not believe soaring will ever amount to anything from a commercial viewpoint. "It is impossible to carry the necessary weights to make soaring a business proposition," he said, "but there is one possibility, however, of making it a commercial enterprise, namely, the joy of riding, otherwise there is none."

Fokker is much opposed to adding a small engine and says it would take the fun out of soaring.

"Soaring and engine flying are both sports, but awfully boring. You cannot get anywhere," he said.

The Royal Netherlands Aeronautic Society has instituted a daily air service between Amsterdam and Brussels, having taken over the management of this line from the Belgian Aeronautic Society.

INDIA

Major Alan Duguid, A. F. C., late R. A. F. and World's Board Commissioner at Karachi, India, writes as follows:

"I am in receipt of your letter of July 19th for which I thank you. Your cable, a copy of which you enclosed, unfortunately did not reach me until some 48 hours after Major Blake's arrival, so I refrained from cabling you, knowing that the information would already be in your hands.

I took the first opportunity, however, of presenting your greetings to Major Blake and his companions, for which he asked me to express to you his thanks. His reception here at Karachi was a cordial one, and he was presented on arrival with an Eastern carpet, which, it is hoped, will

act with its full legendary force, charming the venture, and bringing to it safety and success.

Civil aviation in India, is encouraging, as it is quite one of the most suitable countries for the full display of the benefits of aircraft as a means of rapid and efficient transport. Its climate is equable, and flying is possible during the greater part of the Monsoon period. Aerodromes, thanks mainly to the activities of the Royal Air Force, are increasing in number, and in any case good landing-ground is usually available for cross-country aviators.

No steps have been taken to inaugurate the Rangoon-Bombay route, although the plans are ready. The Government of India has not as yet allotted for aerial purposes, and are considering the initial expenses of an airship or aeroplane service from the continent of Europe to the East.

There is a scheme afoot for the opening-up of a Bombay-Karachi route, but it remains to be seen whether actual steps to set it in motion will be taken. In any case, it is high time India began to tackle seriously its responsibilities in the matter of aviation generally.

May I take this opportunity of congratulating you on your "Aeronautical Digest," which is in every respect an excellent publication.

I will keep you informed of any important aerial developments here in India."

ITALY

The "Societa" Idrovolanti Alta Italia" (SIAI) of Sesto Calende—Lake Maggiore—has communicated, with just pride, the dates upon the recent activity of flight, which show how this very Italian House, besides the industrial development, points also with the same carefulness to the affirmation of air traffic.

Here we give the raids made by the "Savoia" seaplanes in this last semester:

N. 6 times from Sesto Calende to Cartagena, Km. 1550 x 6 = Km. 9000; N. 5 times from Sesto Calende to Barcelona, Km. 900 x 5 = Km. 4500; N. 3 times from Sesto Calende to Palma Majorca, Km. 1100 x 3 = 3300; N. 1 time from Sesto Calende to Valenza, Km. 1250. Total Kilometers, 18,050.

This increasing activity of the Siai is worthy of note being a powerful contribution to the development of air traffic in the Mediterranean Sea.

The Caproni Firm announces that they have completed a new type of an all metal aeroplane.

This news was met with great favor in the Italian aeronautical circles.

It is said that public experiments with the new Caproni will be made soon.

The Minister of War, Hon. Soleri, has decided to send a series of the most modern airplanes and hydroplanes to the International Exposition of Rio de Janeiro.

He has also decided to send several types of small airships, that have been experimented with success during the last stages of the war and after the Armistice.

The planes will be furnished by the Army and will be piloted by Aviators of the Air Service.

The Hon. Soleri has forwarded a circular to all the Italian Constructors of Airplanes and Airships inviting them to send the most modern types of planes to the Capital of Brazil, in order to uphold the prestige of Italian Aviation.

Airmen circled over the church of Loretto, to meet their protectress today when the new statue of Our Lady of Loretto was placed in the Church of the Sacred House at Loretto.

It was an event of the first importance to Catholics, millions of whom from all over the world have gone on pilgrimages to the "Black Madonna" since in 1299 A. D. According to Catholic tradition, angels flew from Nazareth to Loretto, bringing with them the "Sacred House," above which is the church building. It is because of this tradition of the midnight flight of angels that airmen have chosen the "Black Madonna" as their protectress.

The 1922 Schneider Cup, which during the previous three years had been won by Italy, has been awarded this year to Great Britain.

This year's race for the Trophy presented by M. Jacques Schneider, of the famous gun-making firm, was flown at

Naples, and it was open to flying boats and float seaplanes of any nationality.

The Supermarine Aviation Co., Ltd., constructed a special machine, and Messrs. D. Napier and Son, Ltd., supplied one of the World-renowned 450 h.p. Napier aero engines for it.

The winning machine with a motor of 450 H.P. flew the circuit in 1 hour and 34 minutes.

The Italian machine, with a motor of 300 H.P. flew the circuit in 1 hour, 36 min. and 22 seconds.

A new world's speed record has been established by the Italian aviator, Lieutenant Brackpapa. In a biplane with an engine of 700 horsepower he flew four times around the track at Mirafiori, near Turin, twice against and twice with the wind, and the average speed of the four circuits was about 220 miles an hour.

The previous speed record for an airplane was made by Sadi Lecointe, a French aviator, Sept. 26, 1921. It was 205.223 miles per hour. Lecointe used a 300-horsepower motor.

Cardinal Giovanni Tacci, 60 years old, and Cardinal Vitorio Amedeo Ranuzzi, 65 years old, each took an air ride in a Caproni machine to Loretto, where an aviation meet is being held in honor of Madonna di Loretto, patron saint of aviators. Cardinal Tacci flew for twenty minutes and Cardinal Ranuzzi for half an hour. Both expressed great satisfaction with the experience.

This is the first time a Cardinal ever

flew. The plane was piloted by Colonel Armani of the Italian army.

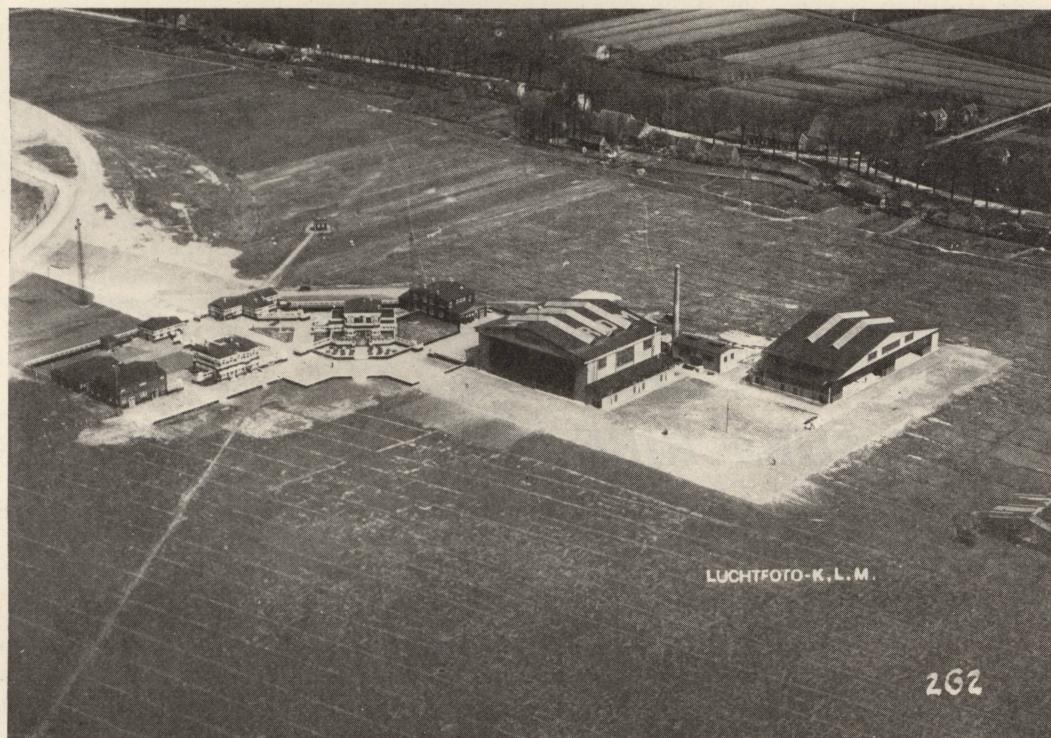
JAPAN

Aeronautical Digest has a cable from **E. W. Frazar**, Commissioner of the Worlds' Board Aeronautical Commissioner for Japan and Corea at Tokio, saying that Lt. Col. L. E. Broome of Major Blake's round the world party had arrived at Tokio, and that the world's flight had been postponed until next year on account of the wrecking of the airplane in the Bay of Bengal. Commissioner Frazar has completed the distribution of fuel for the aviators between Yokohama via the Aleutian Islands—some 5,000 miles to Alaska. The seaplane will find landing harbors every one hundred and fifty miles. When the Pacific is negotiated man will have encircled the globe by air.

An Aerial Service between Tokio and Osaka was recently inaugurated. The difference between the two points is covered in three hours.

The Japanese Navy Has Now Established the Following Hydroplane Bases: Yokosuka, 5 squadrons; Kasumigaura, 7 squadrons; Saseba, 3 squadrons; Omura, 2 squadrons and Lake Hamana. The naval aeronautical program is such that by 1925 Japan will have 200 hydroplanes in service.

A large plan of naval construction, involving the expenditure of 564,000,000 yen, has been submitted by the Japanese Navy Department. This plan which



General view of the airdrome of Rotterdam (Waalhaven).

should be carried out between 1923 and 1927, involves the transformation of the Amagi, Akagi and Hosho cruisers now under construction, so as to make them aeroplane carriers, the first two to carry fifty aeroplanes each, and the third one to carry twenty. These three cruisers will enter active service in 1924.

JAVA

The following report was received from **M. H. Damme**, World's Board Commissioner, Netherland, India (Java, Sumatra, Celebes and Islands of the East Indies): "Our acting Governor General, Mr. D. Fock, is rapidly taking an interest in aviation as did his predecessor, and we hope to soon have an air mail service throughout Netherlands, India and to Australia and Singapore as discussed with you when the American Commission was in Java."

MOROCCO

In Morocco the French army is utilizing in a very extensive way their aerial services for the transportation of mail, merchandise, supplies and ammunition, and also and most efficiently for the transportation of sick troops from the Interior to base hospitals. One hundred and thirty sick troops were transported by air from May 29, 1921, to April 20, 1922, making a total of sixty-five trips, covering a distance of 6070 kilometers.

NEAR EAST

At the end of last month the Royal Air Force took over the entire control of Mesopotamia, and the supreme command of the British forces in that country from now on will be in the hands of Air Vice Marshal Sir John Salmond.

This is the most interesting development in the empire administration in recent years and marks a new era in military aviation, for this is the first time war in the air has been treated as entirely distinct from that on land or sea. Already eight squadrons of the Royal Air Force have been gazetted to the new command. Two of these are equipped with troop-carrying planes, so that they will be able to transport soldiers rapidly to the scene of any native rising. As circumstances make

it necessary, the strength of the air force in Mesopotamia will be increased, and already larger fleets of troop transport machines, made entirely of steel, yet no heavier than ordinary wood and fabric airplanes, are being constructed.

The new policemen of Mesopotamia will have headquarters at Bagdad. It is estimated that the policing of Mesopotamia by the Royal Air Force will reduce the cost of maintaining order in the Near East to one-fifth of the present expenditure.

NICARAGUA

A contract for freight and passenger hydroplane service on Lake Managua and the San Juan River has been approved by the President, and will be effective for fifteen years.

NORWAY

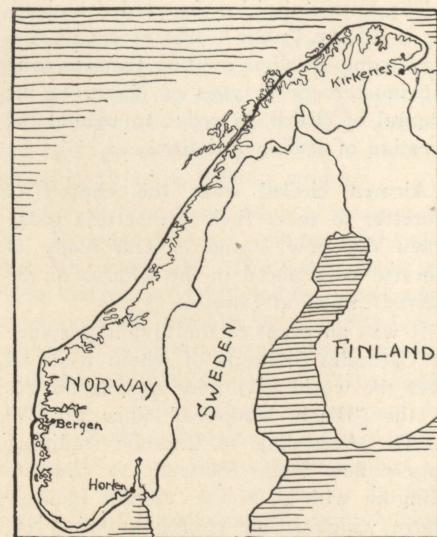
Frois Froisland, Commissioner for Norway of the World's Board sends in the following report:

A remarkable achievement has been carried out by Captain **Riiser-Larsen** and Lieutenant **Lutzow-Holm**, two Norwegian naval airmen who are just back in Horten, the Naval Aviation yard in Norway wherefrom they started on a flight to Kirkenes, a small mining village in Finmarken situated in the farthest north in the vicinity of the Russian border.

This return journey which is the longest flight ever made in the history of Norwegian aviation was undertaken in order to test the endurance and skill of the airmen and also to determine the strength and usefulness of both machinery and body of our Norwegian built aeroplanes. The completion of this flight along the severe and weatherbeaten Norwegian coast, a distance of between 3500 and 4000 kilometers from landsend to landsend is an achievement well worth to be remembered in the annals of aerial navigation and will no doubt range among the greatest exploits of international long-distance records.

The aeroplanes used were two Hydro monoplanes of the Hansa-Brandenberger

type of vessels, built and equipped at the Norwegian Naval Aviation yard at Horten. With their 220 hp. Benz motors developing an average speed of about 160 kilometres the whole distance was covered in 47 actual flying hours.



Map showing the region flown over by Captain Riiser-Larsen and Liept. Lutzow-Holm, of the Norwegian navy in their flight from Kirkenes to Horten, a distance of 4,000 kilometers.

On the return journey the airmen followed the coast line stopping at several intermediate cities and fishing places which had never before been visited by aircraft, and the flight may, therefore, be considered as a tour of propaganda just as well as a brilliant example of the practicability of aviation in every climate.

PORUGAL

The daring Portuguese aviators, who flew across the Atlantic, received a well-deserved ovation when they reached the coast of South America. Despite the delays which they encountered they accomplished an unprecedented feat in the annals of adventure. It is difficult to appreciate the skill and courage required of these men, who broke a path through untracked clouds over 4000 miles of ocean to their objective.

SPECIAL OFFER— SUBSCRIBE NOW—

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AERONAUTICAL DIGEST

DURING THE MONTH OF OCTOBER SEND \$3. TO AERONAUTICAL DIGEST, 342 MADISON AVENUE, NEW YORK, AND YOU WILL RECEIVE FOURTEEN (14) ISSUES OF THE MAGAZINE YOUR SUBSCRIPTION EXPIRING WITH THE DECEMBER ISSUE NEXT YEAR, 1923.

RUSSIA

The "Russische-Baltische Werke," one of the aircraft manufacturing firms of the old Russian regime, has resumed its activities. This firm shall devote itself especially to hydroplane construction.

A Swedish aircraft manufacturing firm has offered to the Russian Government to operate a line Moscow-Stockholm, using for that purpose, Swedish aircraft. The offer is now under consideration.

The opening of the Moscow-Prague line which shall cross Germany and make two stops, one at Dresden and the other at Berlin, has not been inaugurated yet, due to the fact that the government of Czechoslovakia has not granted as yet the permission to fly over its territory which has been applied for by the interested parties.

The aerial mail service initiated on May 6 from Hamburg via Stettin to Danzig, Konigsberg, Kovno, Riga, and Moscow, has made a marked reduction in the time required for delivery of mails between Germany and Russia, according to recent dispatches from Consul Huddle, Hamburg. The saving amounts to 24 hours in mail for delivery to Kovno, and 36 hours for mails to Riga. In addition there is a saving of 5 hr. time in the Danzig and Konigsberg mails.

A daily service from Hamburg to Kovno is maintained, and from Kovno to Riga the trips of the mail planes are on Tuesdays, Thursdays, and Saturdays. From Konigsberg the planes leave on Thursdays and Sundays to Moscow, the flying time to Moscow being in the neighborhood of 37 hr.

The first two months of flying on the Moscow route, beginning May 1, showed 35 trips successfully completed. The total distance covered was 25,300 miles, and the average flying time a trip was eight minutes under 10 hours. The total number of passengers carried was 91. At the same time, the airplanes carried 670 pounds of express matter and 11,450 pounds of mail were handled, bringing the total load well up to their capacity.

SPAIN

The air mail service between Madrid and Vigo which was recently planned for by the Spanish government is going to be inaugurated soon.

This service will be operated by a concern subsidized by the government which shall be selected on the basis of the lowest bid made by the various organizations interested in this enterprise which have been invited to bid.

The service between Barcelona and Palma has been successfully operated during all summer with six hydroplanes.

A company has been formed for operating the line between Centa and Algesiras at only 10 minutes flying distance. The service will be operated by four 6 passenger airplanes and the fare will be fifty pesetas per passenger.

An air mail service between Spain and France is going to be operated by the Latecoere company which besides carrying mail is also going to transport merchandise both ways.

The project has been approved by the State Council of the Spanish Government and its realization shall begin in the very near future.

SYRIA

In Palestine the British Air Service is doing good work with twelve aircraft. In Irak the British aeronautical force is even more active. Communication between Irak and Palestine has been made very easy since the development of aerial lines of communication by the British army.

SWEDEN

A company has been organized at Gothenburg for the purpose of operating the airdrome of the City of Gothenburg. This company contemplates increasing its present capital of 150,000 crowns, so as to be able to buy and operate other airdromes in Sweden.

A record flight of 14 hours and 10 mins. has been made by the Swedish pilot Lieut. Sjungdahl, during which time he covered a distance of approximately 1000 miles.

Two Swedish military aviators, Captain Flory and commander Lybeck, have made an altitude record flight, reaching 5700 meters above Stockholm.

The aircraft used was a hydroplane built by the Swedish "Aero" aircraft manufacturing company which is a branch of the German Hansa-Brandenburg firm. The motor used was a Maybach 240 H.P.

SWITZERLAND

Lieutenant Mueller of the Swiss Army won the contest in the flight around the Alps, an event in the international aviation meet at Zurich held last month.

He covered the distance in eight hours through heavy clouds which made the flying difficult over the high Alpine heights. The majority of the other contestants withdrew.

The operation of the Geneva-Nuremberg line by the "Ad Astra" company with Junkers metallic airplanes is continuing, giving satisfactory results and its extension in the near future is almost certain.

The Aeronautical Festival, organized by the Swiss Aero Club and its Geneva section, the Swiss Aviation Club, the Association des Interets de Geneve, and the town of Geneva, took place at Geneva recently. The program was opened with an international cycle race at the Geneva Voleodrome. A night festival, with fireworks, on the Lake, and the rowing championship contests of Western Switzerland were some of the attractions. But the great event of the festival was the start of twenty balloons representing various countries in the competition for the Gordon Bennett Cup.

TURKEY

French and Italian aircraft in a comparatively large number have been acquired by the Government of Turkey.

Negotiations are now pending between for the sale of twelve French hydroplanes the French and the Turkish Governments to Turkey.

TUNISIA

Baron de la Fargue, Commander of Military Aviation in Tunisia and Commissioner of the World's Board of Aeronautical Commissioners of Tunisia, writes:

"I send you the information concerning an interesting act of prowess accomplished by an aviator of Tunisia.

"Lieutenant Pelletier-Doisy had decided to fly from Tunis to Paris, crossing the Mediterranean length of 1,650 kilometers, without stopping.

"After fitting a military Brègut with extra reservoirs, permitting him to fly for 16 hours, he attempted, with a mechanician, this most formidable raid.

"He started at 5 o'clock in the morning. He crossed the Mediterranean, Tunis-Antibes, in 5 hours, never touching the ground; he continued flying, passing on his way over Marseilles-Lyons and Paris, where he arrived at half-past five in the evening.

"This performance is more remarkable because it was accomplished by crossing the Mediterranean (800 kilometers) with a terrestrial aeroplane, and if any damage should have arrived, it would have been the loss of the aeroplane and its daring pilots.

"The Lieutenant Pelletier-Doisy intends coming back to his post in Tunis by making an air journey, passing by Spain-Morocco and Algeria.

UNITED STATES

At the annual meeting of the Board of Governors, Aeronautical Chamber of Commerce of America, 501 Fifth Avenue, the following officers were elected: President, Inglis M. Uppercu, Aeromarine Plane & Motor Co., Keyport, N. J.; First Vice-President, Charles L. Lawrance, Lawrance Aero-Engine Corp., New York City; Second Vice-President, C. C. Witmer, Airship Manufacturing Co. of America, Hammondsport, N. Y.; Third Vice-President, Lawrence B. Sperry, Lawrence Sperry Aircraft Co., Farmingdale, L. I.; Treasurer, Charles H. Colvin, Pioneer Instrument Company, Brooklyn, N. Y.; General Manager and Assistant Treasurer, S. S. Bradley; Secretary, Luther K. Bell; Assistant Secretary, Owen A. Shannon.

Increases in the Board of Governors from eleven to fifteen were made as follows: I. M. Uppercu, G. M. Williams, General Manager, Dayton Wright Company, Dayton, Ohio; W. C. Young, Goodyear Tire & Rubber Company, Akron, Ohio; Charles L. Lawrance.

The Chief of Air Service has approved the list of Army Air Service pilots and alternates who are to participate in the National Airplane Races at Mt. Clemens, Mich., from Oct. 7 to 14 next.

The Army pilots are as follows:

Lieut. Ernest E. Harmon, Capt. W. R. Lawson, Lieut. Chas. M. Cummings, Lieut. Gerald E. Ballard, Lieut. Philip Melville, Lieut. Erik H. Nelson, Lieut. O. G. Kelly, Lieut. Harold R. Harris, Lieut. Benj. R. Morton, Lieut. James D. Givens, Lieut. Warren R. Carter, Major Follett Bradley, Lieut. F. K. Koenig, Lieut. William L. Boyd, Lieut. Dale V. Gaffney, Capt. Lloyd L. Harvey, Lieut. C. C. Moseley, Lieut. R. L. Maughan, Lieut. L. J. Maitland, Lieut. E. C. Whitehead, Lieut. L. D. Schulze, Capt. F. O. D. Hunter, Lieut. C. L. Bissell, Lieut. E. H. Barksdale, Capt. St. C. streett, Lieut. F. B. Johnson, Capt. Burt E. Skeel, Lieut. Benj. K. McBride, Capt. H. M. Elmendorf, Lieut. Donald F. Stace, Capt. Oliver W. Broberg and Lieut. James D. Summers.

The Navy team is under the command and direction of Lieut. Comdr. Mark A. Mitscher, U. S. N., and is composed of aviators who have been selected especially for their ability to fly the fast types of racing planes that are to compete in Detroit. Those who will represent the Navy are:

Lieut. Frank C. Fechteler, of California; Lieut. Harold J. Brow, of Providence, R. I.; Lieut. A. W. Gorton, of Pawtucket, R. I.; Lieut. William K. Patterson, of Harrisburg, Pa.; Lieut. David Rittenhouse, of St. Paul, Minn.; Lieut. Rutledge Irvine, of Brooklyn, N. Y.; Lieut. H. A. Elliott, of Sidney, Ohio; Lieut. (j.g.) Steven W. Callaway, of California; Ens. Alford J. Williams, of New York City; Capt. Francis P. Mulcahy, U. S. M. C., of Rochester, N. Y.; Lieut. Lawson H. Sanderson, U. S. M. C., of Shelton, Wash.

Co-operation of local aircraft companies, centralization of activities and a comparatively small amount of money spent on the Parkgate municipal field will give Spokane aviation facilities second to none, Captain Lowell H. Smith, famous army flyer, said while in Spokane recently.

In the interests of the Army air service Captain Smith and his aide are making a 6,000-mile trip over the West, mapping the principal landing fields. He will take pictures of 75 fields.

Lieutenants Robert E. Self and Wm. C. Goldsborough, have completed their seven thousand mile photographic mission, having photographed all available landing fields in Northern California and Nevada.

Captains W. A. Bevan and R. G. Irwin and Lieutenants J. P. Richter and C. R. Weber have completed their mission of photographing the landing fields of Southern California and Nevada. An 18,000 ft. high sandstorm was encountered by them on their flight across Death Valley.

Army and Navy officials are making plans for an aeronautic building programme, which will extend over several years and which will mean 2,600 planes. Army officers hope that they will eventually be able to keep 500 planes on each coast and about 1,000 machines at interior strategic points, while in regard to the personnel a detail of 2,500 officers and 40,000 men is desired. Today the Army has but 600 planes, some of them training planes. In addition there are about 400 planes being built or in storage, which might be pressed into service at short notice. The Navy has at present 312 service planes and 233 training planes. That branch of the service is anxious to be as well equipped "aloft" as it now is afloat.

The slowest of them, Gen. Mitchell said, ought easily to cover 200 miles an hour.

These Government planes are being built in the shops of the Loening Aeronautical Engineering Corporation, the Curtiss Aeroplane and Motor Corporation, the Lawrence Sperry Aircraft Company and the Thomas-Morse Aircraft Corporation. The motors are being supplied by the Wright Aeronautical Corporation of Paterson, N. J.; the Curtiss Corporation and the Packard Motor Car Company of Detroit.

Officials of the Army Air Service have entered into a contract with Anthony H. Fokker, of Amsterdam, designer of the Fokker plane, whereby he will build for the United States Government three pursuit machines.

Newport is to become an air port, according to plans of a corporation known as the Newport Airway, Inc., which has obtained a charter from the State. The authorized capital is \$25,000. The object of the corporation is to establish and carry on an air port at Newport and maintain airplane service between Newport and other cities.

Aviation forecasts for the six aviation forecast zones of the United States covering the country east of the Mississippi River are broadcasted by radio from the naval radio station at Arlington at 10.30 A.M. (5950 C.W.) and at 10.00 P.M. (2650 C.W.). The Weather Bureau requests that arrangements be made to have radio operators on duty at Air Service stations within these zones receive these forecasts. The night forecast will cover weather conditions in the zone until noon of the following day, whereas the morning forecast will cover weather conditions from noon until midnight.

The Washington Post and the Washington Herald publish each morning a special forecast furnished them by the Weather Bureau for routes from Washington, D. C., to Norfolk, Va., and from Washington, D. C., to New York City, and arrangements will soon be made for a similar forecast for the route from Washington, D. C. to Dayton, Ohio.

The clearest and probably the most authentic review of aeronautics in the Unit-

ed States is contained in the Aircraft Year Book for 1922, published by the Aeronautical Chamber of Commerce. Profuse with illustrations, the book has been written with a view to proving to the business man that it is he who will benefit, either directly or indirectly, from the standardized development of flying under adequate Government control. Naturally Army and Navy aviation are emphasized, but great stress is laid also upon commercial aviation. In addition there is a section devoted to the progress being made in foreign countries, while the latter half of the book is of a more technical nature, dealing with airplane and air engine designs.

In regard to the uses to which aircraft may be put, it is stated in the book:

"The most valuable service which aircraft provide is speed. Conjoined with this is their unique ability to operate independently of land or water, dominating both in time of war, and capable of adaptation in time of peace to a multitude of novel uses limited only by ingenuity and commercial industrial needs." The following list presents the service of the airplane and airship:

NATIONAL

National defense (Army, Navy, Marine Corps).

Air mail.

Forest patrol.

Coast guard.

Customs and revenue service.

Agricultural survey.

Coast and geodetic survey.

Scientific observation.

Warning and relief in disaster.

CIVIC

City planning.

Road and building construction.

Rail and water terminal problems.

Fire and police zoning.

Park improvement.

COMMERCIAL

Passenger service.

Freight transportation.

Messenger service in banking.

Surveying.

Aerial photography.

Engineering.

Collection and dissemination of news.

Advertising and publicity.

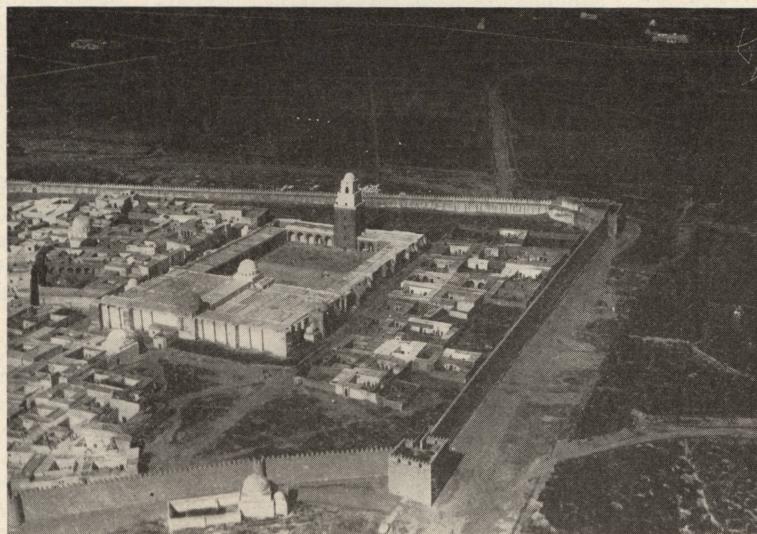
Sport and pleasure.

Commuting.

Planes are becoming more and more trustworthy. In time every house will have a hangar on top of the garage, even if it holds nothing bigger than a glider, writes the New York "Herald."

The big De Haviland planes of the United States Army Air Service, at Crissy Field, in future are to take carrier pigeons out on long trips, in ad-radio sets. The rule also will apply to other coast aero stations quarters.

Interest in aeronautics is reflected in Boston where a large number of private citizens are making contributions to establish a State landing field already authorized by the legislature of Massachusetts.



The Great Mosque of Tunis.

One-third of the Population of the United States will be flying in dirigibles in the near future, according to a prediction of A. Leo Stevens, chief instructor of aeronautics for the United States army at Scott Field. Mr. Stevens, in 1902, made the first dirigible flight in this country.

The dirigibles, Mr. Stevens said, will range in size up to mammoth affairs carrying from ten to twenty motors.

"They will have pontoons," he added, "and the water will be helpful for landing places. The compartments in the large airships will be equipped with safety berths. The touching of a button by the commander will cause every passenger to descend toward earth at the same time. Each berth will have all necessary equipment for landing and floating its passengers to safety.

"The army of the future will travel through the air and it will be nothing to see a thousand or more men transported at one time in one machine."

At the Annual Meeting of the Manufacturers' Aircraft Association, Inc., 501 Fifth Avenue, the following directors were elected: A. H. Flint, L. W. F. Engineering Co., College Point, L. I.; F. L. Morse, Thomas-Morse Aircraft Corporation, Ithaca, N. Y.; F. B. Rentschler, Wright Aeronautical Corporation, Paterson, N. J.; J. K. Robinson, Jr., Gallaudet Aircraft Corporation, East Greenwich, R. I.; F. H. Russel, Curtiss Aeroplane & Motor Corporation, Garden City, L. I.; I. M. Uppercu, Aeromarine Plane & Motor Company, Keyport, N. J.; J. G. Vincent, Packard Motor Car Company, Detroit, Mich.; C. M. Vought, Lewis & Vought Corporation, Long Island City, L. I.; G. M. Williams, Dayton Wright Company, Dayton, Ohio.

Officers were elected as follows: President, G. M. Williams; Vice-President, F. B. Rentschler; Secretary, Chance M. Vought; Treasurer, F. H. Russell; General Manager and Assistant Treasurer, Samuel S. Bradley.

According to reports compiled by the Aeronautical Chamber of Commerce, approximately five hundred persons are being taught to fly at the score or more of flying schools located in various parts of the United States. Among the leaders in civilian flying instruction are New York, Chicago, Dayton, Ohio; San Francisco, and points in Missouri, Oklahoma, and Texas. Most significant returns are found in Dayton, Ohio, "the birthplace of the airplane," where at the field of the Dayton Wright Company, 4,000 inquiries have been received this summer from civilians who are desirous of learning the requirements and cost of instruction in flight.

In the presence of officials of the Aeronautical Chamber of Commerce, the Aero Club of America and others, Lawrence B. Sperry, president of the Lawrence Sperry Aircraft Company, of Farmingdale, L. I., demonstrated his combination wheel and skid landing gear. While in flight he dropped his wheels, and then landed on the skids, stopping in fifty feet. The plane used was a "messenger," powered with a 60 hp. engine, manufactured by the Lawrence Aero-Engine Corporation.

European Powers are spending more money in the development of aviation, are developing superior types of machines and in general are much in advance of the United States, according to Secretary of War Weeks.

Mr. Weeks says this is the substance of a report by Brig.-Gen. William Mitchell, Assistant Chief of the Air Service,

based on the results of nearly two months investigation of the aviation services of the various nations of Europe.

Gen. Mitchell believes, Mr. Weeks said, that commercial aviation should be encouraged in every way possible, in order that the army may have a reserve strength in time of emergency, and also in order to develop to the highest possible point the science of aviation.

At present there is no law providing inspections for pilots or their machines when engaged in the commercial service, Mr. Weeks said, and this fact no doubt gives rise to numerous accidents. These accidents, in turn, act as a deterrent upon the development of aviation, inasmuch as they cause the public to be apprehensive of flying, and therefore cut down the volume of traffic.

As an example of the degree of safety which may be attained in commercial aviation, Secretary Weeks cited the fact that one commercial line operating between Miami, Fla., and Nassau, has transported between 50,000 and 100,000 passengers without a single accident. The same concern, he said, is now interested in developing an air route for commercial purposes between Detroit and Cleveland across Lake Erie.

Lieutenants Hine and Webber, Air Service, have returned to Rockwell Field from a 4,000 mile mapping trip covering Las Vegas, Nevada; Denver, Colorado; Salt Lake City, Utah; Fort Sill, Oklahoma; San Antonio, Texas; El Paso, Texas, and Noagles, Arizona. The total flying time was approximately 39 hours, embracing 10 flights. This is considered to be remarkably good time, especially in view of the fact that they encountered bad weather between Las Vegas and Salt Lake City. Some interesting data on this flight is being compiled by these two officers.

The tour of Sicily on two S-13 Hydroplanes, attached to the hydroplane squadron of the naval base of Naples, has been completed by Commander Miraglia and Corporal De Lio, pilots of the two machines. The raid was made at the speed of flight of 180 kilometers per hour and the route was Naples, Sapri, Messina, Siracusa, Porto Empedocle, Marsala, Trapani, Palermo, Milazzo, Sapri, and back to Naples.

Aeronautical Legislation affecting in a good many ways the development of civil aviation in Italy has been passed by the Italian Parliament with 227 votes in favor of its passage and 44 against.

(Continued from page 129)

Knight, William M. E.
Kraft, Herman T., U. S. A.
Lameda, Dr. Eduardo Arroyo, Venezuela.
Larkin, Capt. H. J., D.F.C.C.deG., Australia.
Larsen, John M., U. S. A.
Lee, Charles G., England.
Leefe, B. W., Ceylon.
Llonoa, Leonicio Oramos y Diaz, Canary Islands.
Luke, G. F., F.R.G.S., Scotland.
Longren, A. K., U. S. A.
Leguia, Señor Juan, Peru.
Magowan, David W., U. S. A.
Maher, Col. John G., U. S. A.
Maia, Hon. Adriano, East Africa.
Makassar Racing Club., Pres., Celebes.
Malone, Hon. William J., U. S. A.
Martin, H. C., U. S. A.
Mascias, Alberto R., Argentine.
Massaquoi, Hon. Momolu, Liberia.
Matte, Jorge, Chile.
McDonald, Philip M., Egypt.
McLellan, A. W., U. S. A.
McLeod, Major Thomas, Australia.
McKinley, J. C., U. S. A.
Meisenheimer, Edward J., U. S. A.
Melas, Michael Leon, Greece.
Messner, Major Emile, Switzerland.
Milosheff, Stoyan, Bulgaria.
Mitchell, Brig. Gen. Wm., U. S. A.
Moffett, Rear Admiral Wm. A., U. S. A.
Moore, R. E., U. S. A.
Murray, Hon. Alexander R., India.
Myers, Walter, U. S. A.
Nelson, O. F., Western Samoa.
Nicholson, Capt. Chas. H., British Columbia.
Partridge, E. J., British West Indies.
Petroff, Pro. A. N., Siberia.
Pinilla, Sr., J. Rosendo G., Bolivia.
Polignac, Monsier Le Comte de, Algeria.
Popovici, Lt. Col. A., Rumania.
Poretilla, Commandant Alberto Lelo, Portugal.
Pratt, Dr. Jos. Hyde, U. S. A.
Pres. Centre Nacional, Uruguay.
Patrick, Major Gen. Mason M., U. S. A.
Quezon, Hon. Manuel L., U. S. A.
Rand, R. R., Jr., U. S. A.
Redden, Chas. F., U. S. A.
Rhodes, Col., The Hon. Sir R. Heaton, New Zealand.
Ricou, C. E. W., Hongkong.
Roach, James H., Esq., Guatemala.
Romberger, Capt. E. W., U. S. A.

Roy, Eugene, Haiti.
Salmond, Sir W. G., H.K.C., M.G., C.B., D.S.O., Great Britain.
Salmond, Sir John, K.C., B.D.S.C., Mesopotamia.
Schuette, Dr. Johann, Germany.
Secy. Chamber of Commerce, Burma.
Secy. Chamber of Commerce and Exchange, Mayla.
Secy. Svenska Aeronautiska Dallskapet, Sweden.
Servis, Capt. John H., U. S. A.
Shaw, Major H. T., Australia.
Scott, Wisner Gillette, U. S. A.
Siedle, Otto, Esq., South Africa.
Simpson, Hon. J. F., India.
Sittenfield, Oscar, Costa Rica.
Smith, Milton G., U. S. A.
Souder, Elwood, Jr., U. S. A.
Spear, Capt. Elmer, Manitoba.
Steenerson, Hon. Halvar, U. S. A.
Stevens, A. Leo, U. S. A.
Stevens, Capt. A. W., U. S. A.
Stone, Milton A., U. S. A.
Stewart, H. R., Canada.
Sykes, Sir Frederick H., G.B.E., K.C.B., C.M.G., Great Britain.
Swaney, W. B., U. S. A.
Tissendier, Paul, France.
Tor, Eugenjusz, Poland.
Trindade, Lt. Commander A., Azores.
Turnbull, W. R., Esq., M.E.F.R., A.E.S., New Brunswick.
Underwood, Arthur A., U. S. A.
Ullidtz, Capt. H. C., Denmark.

Uppercu, Englis M., U. S. A.
Veit, Sidney B., France.
Vernon, Victor, U. S. A.
Wardrop, G. Douglas, U. S. A.
Warner, H. D., Siam.
Waters, C. Phil, U. S. A.
Waters, Dudley, U. S. A.
Watts, N. C., U. S. A.
Weil, John H., Nicaragua.
Whiting, Hon. John D., Syria.
Wood, W. L., England.
Woodcock, Commander Amos W., U. S. A.
Wade, Lieut. Leigh, U. S. A.
Wright, Orville, U. S. A.
Work, Hon. Hobert P. M., General, U. S. A.
Wanamaker, Rodman, U. S. A.
Walsh, Hon. David, Senator, U. S. A.
Warner, Prof. Edward P., U. S. A.
Weeks, Hon. John W., Secy. War, U. S. A.
Willoughby, Capt. Hugh L., U. S. A.

It is interesting to note that Capt. H. Barber, A.F.Ae.S., formerly well-known British designer, constructor and pilot; author of "The Aeroplane Speaks" (which has been adopted by the U. S. Government as an instruction manual for aviators), and the fourth or fifth man to fly in Great Britain, has established an office at 30 East 42nd St., New York, as an aeronautical consultant.

We can congratulate ourselves that Capt. Barber has decided to make America his home.

AERONAUTICAL SITUATION

Aeronautical progress indicates that eventually a large part of transportation now by land and water will go by air route. **The Airplane.**—Rapid Transcontinental and Inter-State service.

The Seaplane.—The entire coast line of countries and over and around great inland bodies of water.

The Airship.—Transcontinental, Inter-State, across Oceans and Seas, to all countries, and around the world.

PRESENT

Personnel—Superb and efficient.

Plant—Sufficient.

Capital—Limited.

Public interest—Limited.

FUTURE

Public interest—Universal.

Capital—Unlimited.

Plant—Unequal to demand.

Personnel—Superb, efficient, will become instructors and directors of aeronautical operations.

VITAL

For a Nation to maintain a Commercial Supremacy, it must have a complete Air Service, inland, and to all the Countries of the World. Otherwise its exports will be minimized and secured by the producing countries operating such an Air Service.

Interest in aviation will be increased, army experts expect, in the forthcoming trials at Fairfield, Ohio, of the largest airplane constructed in the United States. The machine, a super-bomber triplane with a wing spread of 127 feet and carrying six Liberty motors, totaling 2,400 horse-power, will have an estimated speed of 100 miles an hour, with a carrying load of 20,000 pounds. The total weight of the machine, including the carrying load, will be 30,000 pounds. A cruising radius of 1,300 miles is called for by the specifications, exceeding by hundreds of miles the radius of bombing machines now in the service.

The machine will be known as the Barling bomber, in honor of W. E. Barling, its designer, who is said to be a British designer of war aircraft.

The flight of Lieutenant James M. Doolittle, of the United States Army, across the continent in less than a day is the most clean cut sky performance of the summer. Doolittle hopped off at a beach near Jacksonville, Florida, stopped 73 minutes for fuel at San Antonio, Texas, and went on in the second jump to San Diego, California. His flying time for the 2,275 miles was 21 hours and 18 minutes. This means an average speed of a mile and three-quarters a minute.

With flying like this an Admiral or a General could be transported from one side of the country to the other as quickly as a train would take him from New York to Chicago. A map could be sent from Washington to San Francisco in twenty-four hours, and in case of attack from without, no matter how scattered were the air forces of the nation, they could be massed in jigtine.

The navy had the honor of crossing the Atlantic in two hops. Now the army shows how easy it is to cross the continent.

"The death of Prof. Alexander Graham Bell recalls many pleasing incidents in the early days in connection with the telephone," said Major Charles J. Glidden, President of the World Board of Aeronautical Commissioners. "I was manager of the Atlantic & Pacific Telegraph Company and correspondent of the Boston "Dialy Globe" at Manchester, N. H., in May, 1877. Prof. Bell sent me a telegram from Boston and wished to know if I could arrange the wires so that he could have a perfect test of the telephone between Manchester and Boston. The arrangements were made and the tests were satisfactory, between Music Hall in Boston and Smyth's Hall in Manchester.

"At the Manchester end there were present Gov. Smythe, Gov. Cheney, the agents of the several manufacturing companies and bankers and newspaper men, of course. Prof. Gower was at Manchester and Prof. Bell was in Boston. Prof. Gower a few years later was lost in a balloon off the coast of France.

"Prof. Bell was so well pleased with the test that he said that at any time I desired

a position to call on him. And a few weeks later I entered the telephone service. Among the members of the pioneer telephone organization there are only nine now living and I am one of the nine.

"My credentials as correspondent of the Boston "Globe," which I now have, are dated in 1874 and are signed by the late Gen. Charles H. Taylor and by Edwin M. Bacon."

"Americans are quicker than Europeans to grasp the advantages of commercial aviation. This is one of the main reasons why I propose operating a system of air lines throughout America."

This was the statement of Mr. Anthony H. G. Fokker, the famous Dutch airplane designer, to a representative of the London "Evening News," upon his return from a tour of the United States. Mr. Fokker is reported further to have said that he intends to use eight and ten seater air expresses on the American services, and that a factory is being opened in the United States to build the machines. He contends that the vast distances, the quickness of the people to grasp commercial advantages, and the ideal flying weather in many parts of the country make America an ideal country for the development of commercial aviation, and the possibilities of success are far ahead of anything in Europe.

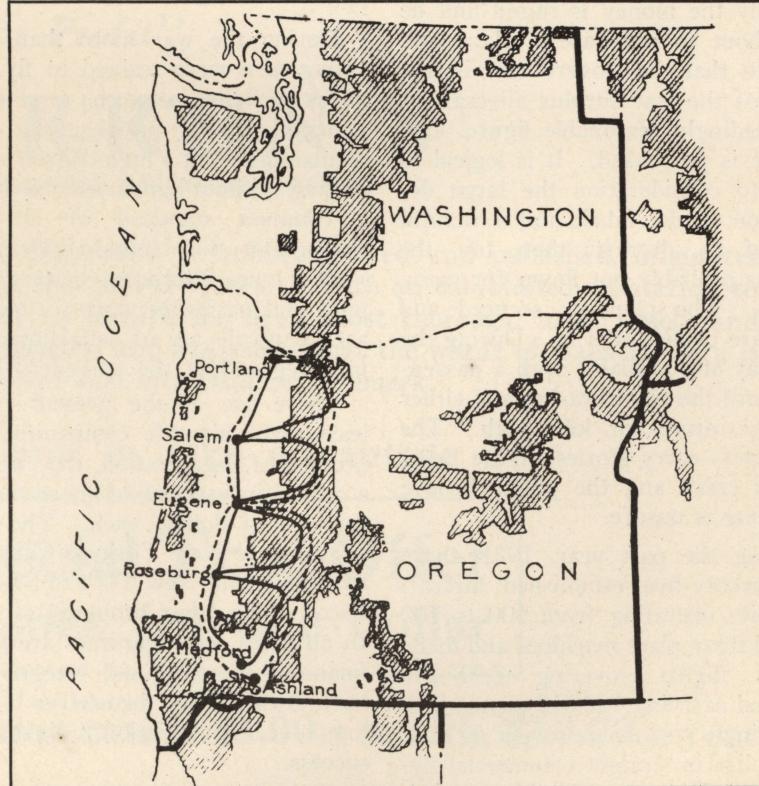
LATEST

ITALY

Experiments in night flying have been recently made at the experimental aerodrome of Monte Celio with most satisfactory results. It is intended to use these experiments as a criterion for laying out a complete project for night flying in connection with the exploitation of commercial aviation lines which are now being started.

The Savoia Aircraft Manufacturing firm is now building a hydroplane capable of flying 5,000 kilometers without alighting. This hydroplane, it is stated, will be used by the Portuguese airmen, Sacadura and Coutinho, for a new flight across the Atlantic. The same firm is also studying a project for the construction of a giant hydroplane, with a capacity of transporting one hundred passengers. This machine, it is stated, will be equipped with sixteen 300 hp. Fiat motors, and will be able to make a continuous flight of 8,000 kilometers. The span of the wings will be 53.30 meters, and the total lifting surface 930 square meters.

A semi-rigid parachute of Italian design has been recently tested at Bagnoli, near Naples.



Map showing routes of airplane patrol operated by the National Forest Aerial Patrol of the U. S. Army Air Service.

What Commercial Aviation Needs

By R. R. Blythe, Chairman of the Aeronautics Executive Organization

HERE are at the present time flying in the United States over 1350 airplanes for civilian passenger and freight carrying, according to R. R. Blythe, Chairman of the Aeronautics Executive Organization. During the month of August, Mr. Blythe states, there are probably more airplanes in the air at one time than any other season of the year. This is attributed to the fact that the greatest number of persons take their vacations during August and the summer resorts are crowded with potential aircraft passengers.

Many a young man who had previously been in the air force during the war and while suffering from the prevalent spring fever feels the call of the air and endeavors to interest two or three persons in the purchase of a plane for the August flying, which as he pictures, will more than repay for the cost of the plane and leave a very generous surplus. Thus easily and convincingly the proposition is placed before the investor as the young pro-motor states that a passenger can be carried for ten minutes charging ten dollars per flight which is apparently an extremely lucrative field of endeavor.

Finally the money is raised and he casts about to purchase a plane and perceives that the Government is disposing of the war surplus air-craft at an exceedingly reasonable figure. One of these is purchased. It is logical to take into consideration the large depreciation on the fabric and structural parts of an aircraft; then, too, the pilot has probably not flown for many months. The plane is secured and flights are participated in. During the gusty day and probably with a passenger aboard the plane crashes and either seriously injures or kills both. The newspapers carry stories of the latest aircraft crash and the public believe that flying is unsafe.

During the past year, 1921, there were twenty-five established aircraft companies operating from 500 to 600 two and three place machines and made 130,736 flights covering 2,907,245 miles and carrying 122,512 passengers. Not a single person, passenger or pilot lost his life in straight commercial flying. With Federal regulation, controlling stuntng and enforcing proper field policeing and protection it is believed certain that flying is one of the safest means of transportation.

Congress, it is hoped, will soon take up the passage of the Wadsworth bill No. S3076 under Samuel E. Winslow, Chairman of the House Committee on Inter-State and Foreign Commerce. Some of the proposals for regulation which would immediately help civil aviation developments in this country are as follows:

1. Federal rather than State laws.
2. Establishment of a number of important landing fields in key cities under the direction of the local Chamber of Commerce each one with its inspector.
3. Checking of each plane as it starts off or lands and thorough inspection of aircraft and pilot
4. Clear marking of fields.
5. Broadcasting by radio across the country of weather conditions: Posting of weather bulletins on each field.
6. Erection of night beacons.
7. Strict licensing, etc.

There is no doubt that a good pilot can guide a poor machine to safety with greater chance of success than a poor pilot can operate a first class craft. Therefore, at the very top of the list of Governmental needs we place the Federal examination and licensing of pilots.

During the war more than 17,000 young men were trained to fly. The knack of flying cannot be retained perpetually without practice, nor can it be maintained at a high degree of competency without regular examination on a common standard of all flying throughout the United States. The same is true of aerial navigators. Both pilot and navigator (many times they are identical) are of equal importance in safeguarding the travellers by air.

There are at the present time at least three aircraft companies in the process of organization, that will have a capital investment of more than two millions of dollars each. The routes planned are New York to Chicago, in two cases, and New York to San Francisco, is the other proposed air route. In all cases the organizers are men of financial standing and integrity, and have drawn about themselves the leading pioneers of aviation, to insure their success.

Everyone knows the uses for aircraft—even the children realize that the fastest means of transportation today lie in the aeroplane. But the general public has not realized the infinite

pleasure of sitting in comfort and ease in the palaces that nestle in the cloud lanes of the sky.

The dreams of long ago for the flight of man are realized—out of the silvery tissue of man's imaginative dreams has come the reality in form of broad white sturdy wings, that balance their palatial cabin of mahogany and silver—and in its haven of comfort we can travel in the luxury that would be the livid envy of ancient jewelled kings.

NEWS TOO LATE FOR CLASSIFICATION

The Fairey Aviation Co., Ltd., are designers and constructors of Seaplanes, Aeroplanes, Amphibians, Flying Boats, etc. Head Office—Hayes, Middlesex. Works—Hayes, Middlesex, and Hamble, Southampton, England. The first transatlantic flight from East to West was accomplished by Com. Sacadura Cabral and Capt. Gago Coutinho on a Fairey from Portugal to Rio Janeiro, Brazil. All machines are fitted with Fairey Patent Variable Camber Wings, giving high performance and low landing speed. Fairey Series III Load Carrying Seaplane carries 3,100 lbs. of useful load with one 360 h.p. engine. The full load was lifted from the sea in mid-Atlantic. Speed with full load, 83 knots. Landing speed with full load, 43 knots.

The Rolls-Royce, 15 Conduit St., London, England—Latest successes: First in the King's Cup Race (9th September, 1922). Sir Samuel Instone's De Haviland 4a Machine with 360 h.p. Rolls-Royce "Eagle" Engine. First in the Royal Air Force Handicap Avro-Aldershot Bomber with Rolls-Royce "Condor" Engine. Previous successes: Across the Atlantic (without a stop), 1,890 miles. England to Australia—11,500 miles. England to South Africa—6,281 miles. England to Sweden (and back), 2,450 miles. Across the South Atlantic—3,822 miles. England to Constantinople—2,160 miles. England to Finland—1,100 miles. England to Warsaw—1,050 miles.

Ten Weeks of 100 Per Cent Performance on All Three Divisions of the Trans-Continental Air Mail Service stands as the record to date. A radio from Iowa City reporting a default on account of bad weather ended the longest period of perfect flying the air mail has made. From the second week in July through the third week in September every mail plane left its field according to schedule and the mail was carried the entire way to the destination by air. Each plane carries from 400 to 500 pounds of mail containing approximately 20,000 letters on each trip. For the last year 92 per cent. performance was made by the air mail.

Major General Mason M. Patrick, Chief of Air Service, Wires Aeronautical Digest: "Official flying time C-2, 67 hours, 24 minutes." The route was via Ohio and Texas points—which increased the direct mileage between Washington and San Francisco. Note: A complete report of this great flight across the American Continent will be published in the November issue of AERONAUTICAL DIGEST.—Ed.

Capt. Hinton Asks New Outfit for His Seaplane. The wait will delay him three weeks, on his flight from New York to Rio Janeiro (Haiti Special).

Edsell Ford Has Deposited \$10,000 to guarantee the prize money to be distributed among entrants in the aviation flight to be held at Detroit in October.

The New Seaplane "Wilbur Wright" will be used at the Detroit meet as a pylon station above a U. S. Cruiser, to report positions of the airplanes at the far points in the triangular course.

General Electric Company are demonstrating a large searchlight and mirror which they have just completed and think it will be the beginning of land lighthouses for night use of airplanes. Light beam was seen at 65 miles distant.

Lieut. Fuller and Wife are making vacation visit in Vincent Astor's mono-seaplane. The trip from New York to Bar

Harbor was made in four and three-quarter hours actual flying time.

One Thousand British Airmen Have Arrived at Constantinople.

London.—There is now being built for the Air Ministry the first flying stores and workshop ever constructed in this country. The machine has a large fuselage and is to be used to carry spare parts with operating air fleets. This will avoid the necessity of an airplane having to return to headquarters to obtain the requisite spare parts for repairs when some slight trouble has developed, or as an alternative, having to make a forced landing.

If a pilot, when flying on maneuvers, develops "trouble" of some sort, he will signal to the flying workshop which will carry spare parts of the type that are being used by the unit. The two machines will then alight in some suitable place where the necessary work can be done.

As soon as the first flying workshop is completed and satisfactorily tested, a number of similar craft will be built.

—*Christian Science Monitor.*

London.—In a recent article it was pointed out that a World Flight Trust was a possibility, in view of the commercial aspect, the great expense involved and the opportunities to make money out of cinema, news-

paper, and lecturing rights. Partial realization of the idea already has come. The secretary of the Royal Aero Club has just informed the representative of *The Christian Science Monitor* that the organization of the attempt to be made by Captain Macintosh, Captain McCloughrey, and Captain Tymms is to be through a private limited company.

Shares are not to be disposed of through appeal to the general public, but among those interested in British aviation; and it is not with the object of distributing a loss so much as that of sharing a profit. The method is not so modern as might at first thought seem: did not the merchant adventurers of old resort to the private company method of "raising the wind"?

For this venture the capital needed is about £15,000. Return is quite reasonably looked for in the sale of newspaper rights, remuneration for articles, cinema rights, and proceeds of lecture tours.

—*Special from Monitor Bureau.*

Chicago.—This city will become the headquarters of the airplane mail service in the United States, and letters will be carried from New York to San Francisco in 28 hours as a result of contracts for construction to be let here by Col. Paul Henderson, second assistant Postmaster General, who has arrived from Washington to supervise personally the start of the project.

—*Special from Monitor Bureau.*

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from

The Aeronautical Chamber of Commerce of America

USES TO WHICH AIRCRAFT CAN BE PUT

National

National Defense (Army, Navy, Marine Corps)
Air Mail
Forest Patrol
Coast Guard
Customs and Revenue Service
Agricultural Survey
Coast and Geodetic Survey
Scientific Observation
Warning and Relief in Time of Disaster

Civic

City Planning
Road and Building Construction
Rail and Water Terminal Problems
Fire and Police Zoning
Park Improvement

Commercial

Passenger Service
Freight Transportation
Messenger Service in Banking
Surveying
Aerial Photography
Engineering
Collection and Dissemination of News
Advertising and Publicity
Sport and Pleasure
Commuting

FOREIGN SUBSIDIES FOR CIVILIAN AVIATION

Country	1921
Australia	£54,000
Belgium	1,600,000 francs
Czecho-Slovakia	3,200,000 kr.
France	31,700,000 francs
Germany	21,000,000 marks (proposed)
Great Britain	£81,000
Italy	4,500,000 lire
Japan	50,000 yen
Netherlands	200,000 fl.
Roumania	6,500,000 leis.

(There is no subsidy in the United States.)

DATA ON AIRCRAFT MANUFACTURING

Number of Plants, Production and Experimental	25
Invested Capital	\$10,000,000
Number of Persons Employed	5,000
States in which Plants are Located:	
New York	
Ohio	
Kansas	
Rhode Island	
Michigan	
New Jersey	
California	
Washington	
West Virginia	
Wisconsin	
Number of Trades Required in Aircraft Construction	72

PARTIAL LIST OF MATERIALS REQUIRED IN AIRPLANE CONSTRUCTION

Steel
Aluminum and its Alloys
Copper
Many kinds of woods
Cotton and linen fabric
Dope, paints, varnishes and glue
Leather
Rubber

AIRCRAFT BOMB BATTLESHIPS

Beginning June 21 and ending July 21, 1921, 100 miles off the Virginia Capes, airplanes of the Army, Navy and Marine Corps attacked and sank warships of the latest design, ranging in type from submarine, destroyer, and light cruiser to dreadnought. The submarine went down in 16 minutes, the destroyer in 19 minutes, the light cruiser in 35 minutes from the time the first 600 pound bomb was dropped, and the dreadnought 21½ minutes after the first 2,000 pound bomb was launched from the airplanes.

COMMERCIAL AIRCRAFT OPERATIONS IN U. S. 1921

Estimated Number of Aircraft in Operation...	1,200
Estimated Total Mileage	6,500,000

Estimated Number of Persons Flown.....	250,000
Operators Making Reports	125
Equipment of these operators (No. Machines). 500 to 600	
Mileage Flown by These Operators.....	2,907,245
Number of Passengers Carried by These Operators	122,512
Pounds of Freight Carried by These Operators.	123,227
Number of Flights by Operators.....	130,736
Average Duration of Flights	21 min.
Average Charge per Short Flight.....	\$9.00
Average Charge per Mile, Inter-City Flight...	.55
Average Charge per Pound of Freight.....	.33
States in Which Operations were Carried on....	.34

Operators reporting as above, had in 1921, but 146 Air Terminals for seaplanes and airplanes. Only sixteen of the 146 were publicly owned or controlled.

FACTS ABOUT THE AIR MAIL

Length of New York-San Francisco	
Route	2,680 miles
Number of Airplanes in Service.....	80
Miles flown with mail since inception of service, May 15, 1918 to December 31, 1921	3,053,026
Percentage of Performance Since Inception	87.96
Pounds of Mail Carried Since Inception	2,499,643
Approximate Total Number of Letters Carried	100,000,000
During twelve months ending July 18, 1922, the U. S. Air Mail Service operated without a serious accident.	

FACTS ABOUT THE FOREST PATROL

Season 1921—California, Oregon and Washington	
Total Number of Fires Reported.....	1,248
Number of Fires Reported First by Air Patrol	373
Number of Fires Reported by Radio..	691
Communication Efficiency	67.39%
Accuracy of Location	91.12%

AIRCRAFT APPROPRIATIONS, UNITED STATES AND FOREIGN

United States	1921
Air Mail	\$1,250,000
Army Air Service	19,200,000
Naval Air Service	13,413,431
National Advisory Committee for Aeronautics	200,000

\$34,063,431

Foreign	1921
Argentina	\$271,263.17
Belgium	22,000,000 francs
Canada	\$1,625,000
Chile	\$500,000
Czecho-Slovakia	6,800,000 kr.
Cuba	\$10,970.76
Ecuador	20,000 sucre
Great Britain	£19,033,400
France (1922)	436,000,000 francs
Italy	64,760,000 lire
Japan	43,000,000 yen
Mexico	6,000,000 pesos
Peru	\$500,000
Portuguese East Africa	100,000 escudos
Roumania	35,000,000 leis
Serbia	12,000,000 dimars

SIGNIFICANT STEPS IN AVIATION

On December 17, 1903, Orville Wright, in a biplane designed and constructed by his brother Wilbur and himself, equipped with a 16 h. p. motor, also of their design and construction, made the first successful flight in a motor-driven flying craft—12 sec., at 30 to 35 miles an hour.

Orville Wright, an American, was the first man in the world to fly in a heavier-than-air machine. In the calendar year 1921, in the United States alone, nearly a quarter of a million people were carried by air.

On November 13, 1908, Wilbur Wright established what was then a world's altitude record of 82 feet.

On September 28, 1921, Lieut. J. Macready, U. S. Air Service, in an American designed and constructed biplane, equipped with a 400 h. p. Liberty motor, ascended 35,563 feet over Dayton, Ohio.

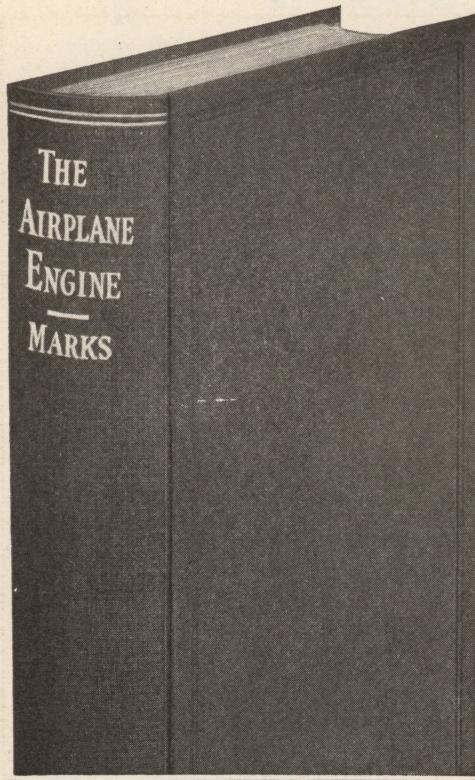
On September 21, 1908, Wilbur Wright, in France, established a world's record speed of 27.2 miles an hour.

On November 3, 1921, Bert Acosta, in a Curtiss-Navy Racer with a Curtiss C 12 motor, established a new world's record for speed on a closed circuit, at the Pulitzer race in Omaha, flying at the rate of 176.7 miles an hour the entire course of 150 miles.

Santos Dumont, in a flight in France, on November 12, 1906, astounded the world by making what was then the unparalleled duration record of 21 seconds.

Pilots Stinson and Bertraud, in a Larsen monoplane, remained aloft at Roosevelt Field, Long Island, on December 30, 1921, for 26 hours and 19 minutes and 35 seconds, thus breaking all records.

The fourth world's record in aviation for the year 1921 also went to American craft and an American pilot. David McCulloch, with three passengers, climbed to 19,500 feet in a Loening monoplane air yacht, Liberty motored, at Port Washington, Long Island, on August 16, 1921.



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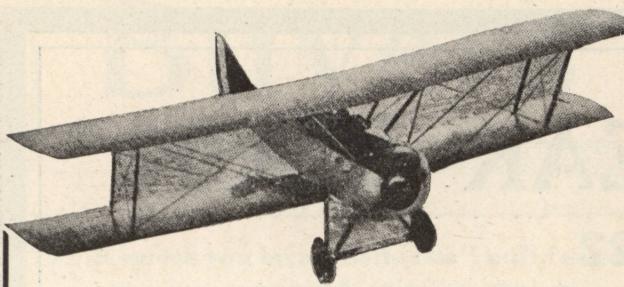
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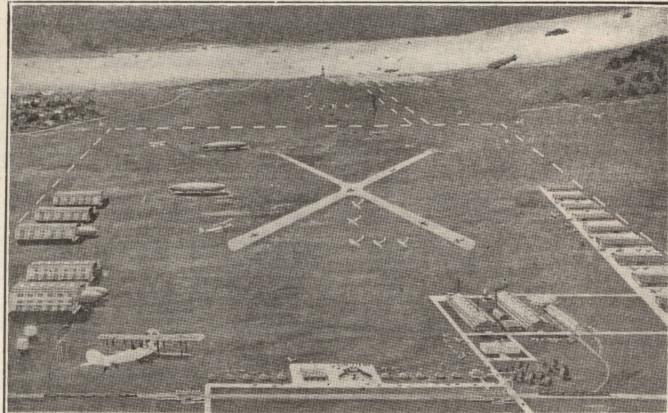
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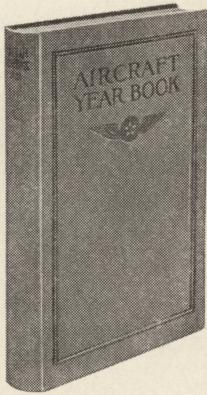
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FOR 1922

Published by Aeronautical Chamber of Commerce of America, Inc.

250 Pages Text; 40 Pages Illustrations; 40 Pages
Aircraft and Engine Drawings

TABLE OF CONTENTS



CHAPTER	
I	Review of Commercial Aviation During the Year—Aircraft Demonstrate Practical Utility—Significance of Aircraft Battleship Demonstrations—Air Law in Sight—Aeronautical Chamber of Commerce Organized.....
II	Problems of Aerial Transportation—Capital, Terminals, Reliability—Needs Which Can Be Met Through Aerial Law—Report to Secretary of Commerce on Safety in Flight.....
III	The Air Demonstrates Its Command of the Sea—The Battleship Bombing and Conference on the Limitation of Armaments
IV	Review of Aeronautics Throughout the World, Nation by Nation
V	Technical Progress in Aircraft Construction During the Year.
VI	Airships in Commerce
HISTORICAL DESIGN SECTION	

APPENDIX

Embracing Every Fact Concerning American Aeronautics

Commercial Section: Aeronautical Chamber of Commerce of America, Inc.; Manufacturers Aircraft Association, Inc.

U. S. Air Service, War Department: Organization; Officers on Duty in Washington; Army Corps Areas and Departments; Stations and Activities.

Bureau of Aeronautics, Navy Department: Organization; Officers on Duty in Washington; Officers with the Fleets; Naval Air Stations.

Marine Corps, Navy Department: Organization; Officers; Aviation Stations.

Strength of U. S. Air Forces (Army, Navy, Marine Corps); Diplomatic Service of the U. S.; Air Attaches, War Department; Air Attaches, Navy Department; Diplomatic Service to the U. S.; Foreign Air Attaches; Aeronautical Board; Personnel and Committees; Helium Board; Board of Surveys and Maps; Department of Interior.

Aircraft Appropriations, Foreign; Aircraft Appropriations, U. S.; Military; Naval, Postal; Aircraft Production Cost, 1917-1918; Foreign Subsidies for Civilian Aviation; Armament Conference Report on Aircraft.

Air Mail Service, Post Office Department: Executives; Air Mail Fields; Transcontinental Controls; Planes in Service; Consolidated Statement of Performances, May 15, 1918—Dec. 31, 1921; Forest Fire Patrol, Department of Agriculture; National Advisory Committee for Aeronautics; Organization; Summary of Report; Presidents Letter of Transmittal; Customs Regulations, Treasury Department; Public Health Service, Treasury Department; Aircraft Imports and Exports; Bureau of Standards, Department of Commerce; Bureau of Foreign and Domestic Commerce, Automotive Division, Department of Commerce; Air Law Section: Wadsworth, Bill, creating Bureau of Civilian Aeronautics in Department of Commerce; Fake Stock Warning, National Vigilance Committee; Associated Advertising Clubs of the World; Aircraft Insurance; National Aircraft Underwriters Association; Colleges and Schools Offering Courses in Aeronautics; Landing Fields and Air Terminals; Chronology for 1921; Remarkable Aeronautical Performances, 1920; Worlds Records, 1921; Trade Index.

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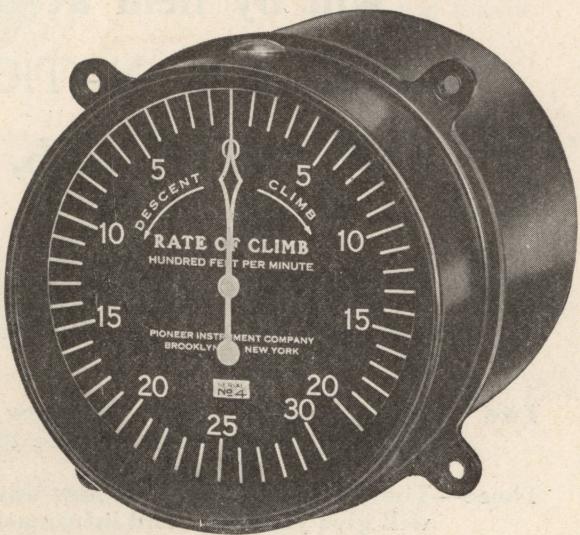
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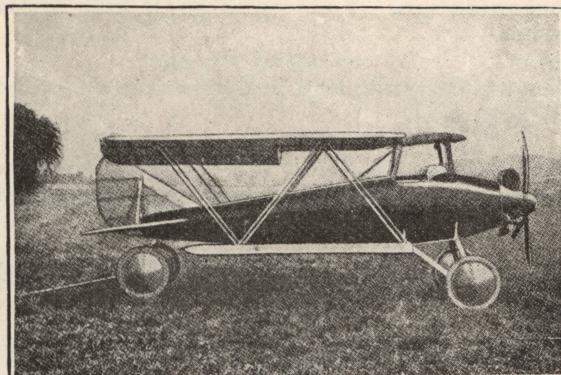
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